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VIBURNUM PRUNIFOLIUM AND VIBURNUM OPULUS.

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Member of Research Committee C, Revision Committee of U. S. P.

The two barks, Viburnum prunifolium and Viburnum opulus, have been for some time almost equally popular among practitioners. Wherein lies the advantage of one over the other, therapeutically, is, perhaps, difficult for one to say without more data than is at present at our command; but, as far as my investigations have gone, it appears that the prunifolium is more frequently depended upon in neuralgia of the ovaries, that the opulus is most useful in uterine and ovarian pain, in dysmenorrhœa and pains of that class, and that it is more often depended upon for prevention of abortion whether accidental or habitual. But it is not so much a question of therapeutical merits of the one or the other of these barks which so much engages the attention of the pharmacist, as it is the physical characteristics which will enable one to assure himself of their purity.

The Pharmacopœia describes these two barks as follows:

VIBURNUM OPULUS.

"In flattish or curved bands, or occasionally in quills, sometimes 30 centimetres long, and from 1 to 1·5 millimetres thick; outer surface ash-gray, marked with scattered, somewhat transversely elongated warts of a brownish color, due to abrasion, and more or less marked with blackish dots, and chiefly in a longitudinal direction, with black, irregular lines or thin ridges; underneath the easily-removed corky layer of a pale brownish or somewhat reddish-brown color; the inner surface dingy white or brownish; fracture tough, the tissue separating in layers; inodorous; taste somewhat astringent and bitter."

VIBURNUM PRUNIFOLIUM.

"In thin pieces or quills, glossy purplish-brown, with scattered warts and minute black dots; when collected from old wood, grayish-brown; the thin,

corky layer easily removed from the green layer; inner surface whitish, smooth; fracture short; inodorous; somewhat astringent and bitter."

Among the problems presented to Research Committee C by its chairman, Dr. H. H. Rusby, is one which relates to the question of discrimination of these two barks, particularly in the crushed or powdered condition, and one relating to the distinction between the bark of the root and bark of the stem of Viburnum prunifolium. Entering upon the investigation, I have formulated the problem as follows:

(1) What are the distinguishing characteristics which will identify the bark of the stem and the bark of the root of Viburnum prunifolium?

(2) How can one distinguish between the bark of Viburnum prunifolium and V. opulus?

(3) What are the differential characteristics of these barks which will enable one to distinguish between them in the crushed condition or in the state of powder?

Before seriously taking up the third question, it is necessary to have clearly before one the gross characteristics of these barks, and to understand the relation between them structurally as well. At the same time, it is essential that such a knowledge of the constituents be had as shall enable one to compare them pharmaceutically.

It is the object of this paper to lay before those who desire to contribute to the work a statement of what has been done thus far in answering the first and second questions. I am gratified to state that there are those, even outside of the committee, who have interested themselves in the work, and who desire such a statement. It is this that has suggested this paper.

For authentic specimens for the investigation I am indebted to Dr. H. H. Rusby. These were as follows:

NAME OF SPECIMEN AND PHYSICAL CHARACTERISTICS.

I. *Viburnum opulus.*—Trunk bark, commercial specimen from Parke, Davis & Co. Curved pieces from 6 to 10 inches (150 to 250 mm.) in length, and about $\frac{1}{12}$ inch (2 mm.) in thickness, the inner surface usually with strips of the white wood adhering. The bark consists of three layers, the periderm, a green chlorophyll layer, and a yellowish or brownish-yellow inner bark. The periderm is nearly smooth, especially on the younger bark, greenish or greenish-gray, marked with greenish and whitish patches, and

with brown, corky warts. Fracture short through the outer layer; the inner layer tears in long, fibrous strips

II. *Viburnum prunifolium.*—Trunk-bark collected by Dr. H. H. Rusby, at Franklin, N. J., May, 1894. Curved pieces and fragments about 1/6 inch (4 mm.) thick; outer surface very rough, greenish or grayish, covered here and there with gray lichens; inner surface yellowish-white, about half as thick as the corky layer, free from adhering wood; the cork is thick, reddish, and shows, on a cross-section, small white spots dotted throughout its tissue. Fracture short.

III. *Viburnum prunifolium.*—Bark collected from small branches. Small curved pieces, very thin; periderm brownish-gray, smooth, overlaying a green chlorophyll layer; inner layer whitish, its inner surface yellowish-brown from exposure to air. Fracture short. It seems to possess the bitter principle to a greater extent than any of the preceding.

IV. *Viburnum prunifolium.*—Bark of root collected at Franklin, N. J., May, 1894, by Dr. H. H. Rusby. Quills or fragments, sometimes with strips of the yellowish-white wood adhering to the inner surface, which is brownish by exposure to air. The corky layer is grayish-brown, somewhat ridged so as to form more or less distinct meshes. The inner layer is thick, breaking with a short, or sometimes waxy, white fracture, easily cut or scraped with the fingernail.

V. *Bark of root* (*source unknown*).—Flattish or curved pieces, from 1/8 to 1/6 inch (3 to 4 mm.) in thickness, covered by (or sometimes deprived of) a reddish or grayish-red cork. Inner layer of about equal thickness to the outer, breaking with a short, brownish-white or white fracture.

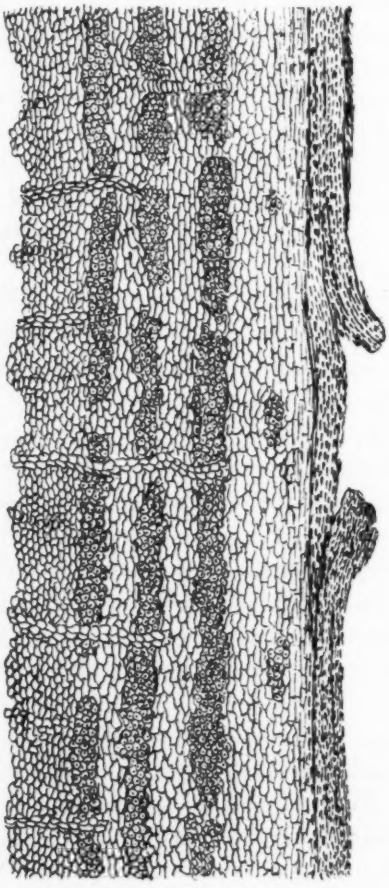
All of these specimens have a pronounced, peculiar odor, difficult to describe, differing quite considerably among themselves in this respect. The root-bark of Viburnum prunifolium has a somewhat disagreeable odor. All contain a bitter principle, this bitterness being particularly prominent in the root-bark and bark of small branches of V. prunifolium. In the trunk-bark the bitterness is noticeably less. In Viburnum opulus there is not much bitterness, but there is quite an astringent taste.

STRUCTURAL CHARACTERISTICS.

A cross-section of the stem bark of Viburnum opulus under the microscope shows the following structure: Immediately interior to

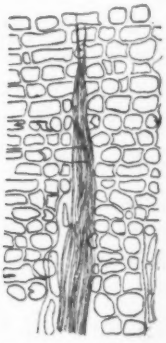
the periderm are numerous irregular clusters of stone cells. These are succeeded in the inner or bast layer by large clusters of bast fibres associated with a few stone cells. These clusters are arranged in bands parallel to the surface of the bark, and are separated from each other radially by narrow, one or two-rowed, straight medullary

FIG. 1.



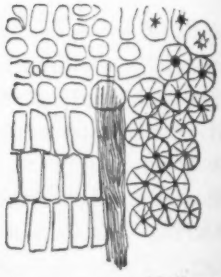
Viburnum opulus—Bark of stem. Cross-section.

FIG. 2.



Viburnum opulus. Bark of trunk. Longitudinal section.

FIG. 3.



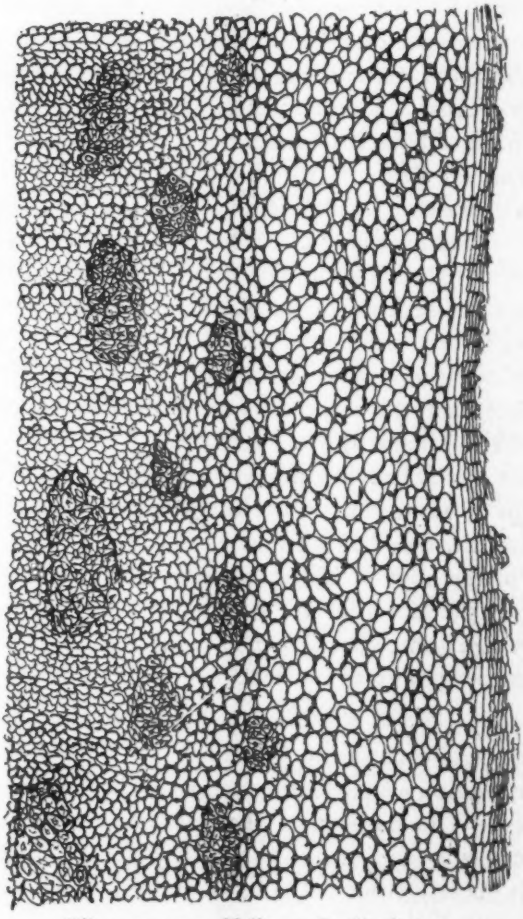
Viburnum prunifolium. Bark of trunk. Longitudinal section.

rays. The clusters are also partly or wholly encased in thin-walled crystal cells, each usually containing a single crystal of calcium oxalate. These interrupted bands of bast fibres and stone cells are separated from each other by rather broader bands of soft bast, in which also a few scattered stone cells and bast fibers occur.

Tests by means of ferric solutions show the presence of considerable quantities of tannic matters in the middle bark, in the soft bast and in the medullary rays.

A cross-section of the stem bark of V. prunifolium shows groups

FIG. 4.



Viburnum prunifolium—Bark of root.
Cross-section.

of stone cells somewhat irregularly disposed, but no bast fibres. These groups appear in this section rounded or somewhat elongated in a tangential direction, or sometimes irregular in outline, but in longitudinal view they appear mostly fusiform, and sometimes five or

ten times as long as thick. The component cells are also of large size.

The clusters of stone cells occur both in the middle and in the inner layers of the bark, but are larger in the latter.

The medullary rays, which in this species are also straight and composed of one or two rows of cells, are much less easily traceable than in the former species, because the cells differ little in size and shape from adjacent parenchymatous elements. They are best recognized by means of iodine solution, their cells containing more starch than those of adjacent tissues.

Freely sprinkled through the parenchymatous regions of this bark are cells containing stellate crystalline masses of calcium oxalate,but cells containing single crystals are rare or wanting, and there is no crystal sheath about the masses of stone cells.

Tannin is also present in this bark, but apparently somewhat less abundant than in the former species.

The bark of the young stems or branches differs from that of older ones, in the fact that the stone cells are in smaller groups. This is because in the old bark the earlier formed masses of stone cells have been cut off by the secondary cork formations, and the later formed groups of stone cells in the inner layers of the bark are of larger size than the older ones farther exterior.

The bark of the root of V. prunifolium differs from that of the stem chiefly in the fact that its groups of stone cells are farther apart and average somewhat larger in size. The outer bark is also thicker and more spongy in its texture.[1]

PHARMACEUTICAL EXAMINATION.

Five grammes of each of the powdered drugs were taken, and, by means of the continuous extracting apparatus, chloroformic extracts were obtained. The amount of the extractive obtained from the two official drugs by this means was quite different, that of the prunifolium being nearly twice that of the opulus. The physical characteristics of these chloroformic extracts were similar, resin-like, yellow to green in color, sticky to the touch, and having a very

[1] It appears possible to distinguish between the two species, V. opulus and V. prunifolium, by the presence or absence of stone cells. A further report will be made on this point when some experience has been obtained in practically distinguishing the powders of the two species.

bitter taste. The extractives were then allowed to evaporate down and their solubility in water was taken. Of the Viburnum opulus 0·00459 gramme was dissolved, and of the Viburnum prunifolium 0.005 gramme, showing both to contain about the same amount of the principles soluble in water. This extractive was of a clear, greenish color and very bitter, that of the opulus being the more bitter of the two.

The residues remaining after treating the chloroformic extracts with water were next treated with a small quantity of petroleum spirit and filtered, the total extractive of the Viburnum opulus being 0·0834 gramme, and that of the V. prunifolium 0·3915 gramme. These figures show a marked difference in the amounts of the fixed oil (?) contained in the two barks. The physical properties of this fatty material from the different barks were similar in most respects. Both were of a pale green to yellow color, rather sticky, showing the presence of a small quantity of resinous matter; hard to saponify, darkened with sulphuric acid, and, in case of the opulus, a slight reaction was obtained with hydrochloric acid.

The chloroformic residues which remained, after extracting with water and petroleum spirit, were macerated for two days in 80 per cent. alcohol. The quantity of extractives obtained thereby was, of Viburnum opulus, 0·122 gramme, and of the V. prunifolium, 0·0375 gramme, showing the extractive of the opulus to be considerably larger than that of the prunifolium. The physical characteristics were similar. Evaporated to small bulk and poured into acidulated water gave a large precipitate of resin from the solution of Viburnum opulus, but scarcely any with the prunifolium.

The powdered drugs which had been treated with chloroform were dried and subjected to the action of alcohol for fourteen hours. The quantity of extractive from each was as follows: Viburnum opulus, 1·515 gramme, and V. prunifolium, 0·969. The only distinguishable point of difference in these extracts was the very astringent taste in that of the opulus, which was almost entirely lacking in the extractive of the prunifolium. Evaporating to small bulk, and pouring into a large volume of water, a precipitate of resin came down from both solutions, but much larger from the prunifolium than from the opulus.

The analysis was continued through an alcoholic and aqueous solution of the dregs in turn, and an examination was also made of

all the barks in order to compare them; but as this part of the examination did not yield results which appear of special significance now, they need not be here recorded. The examination of the chloroformic extract proves the most interesting, and is worthy of mention at this time.

TABULATION OF RESULTS.

	V. opulus. Per cent.	V. prun. Per cent.
Chloroformic extract	5·98	9·46
	V. op. Per cent.	V. prun. Per cent.
(*a*) Soluble in water	·0918	·100
(*b*) Soluble in petroleum spirit	1·66	7·83
(*c*) Resinous matter	2·44	·75
(*d*) Residue	1·7882	·78

For this comparison of constituents I am indebted to the assistance of Mr. E. E. Cowman, who performed the work under my direction. The figures are his. Work on the proximate analysis of the different specimens is still in progress, and what is here preented must be regarded as preliminary.

These preliminary results seem to justify the hope that a means may soon be discovered by which the different barks may be distinguished even in the state of powder. The practical details for this discrimination are not yet worked out. It is hoped this preliminary report will be a help to those who may desire to offer assistance in perfecting these details.

BALSAM COPAIBA *vs.* GURJUN BALSAM.

By Lyman F. Kebler.

For some time considerable unrest has been displayed by several dealers concerning the questionable purity of some of the balsam copaiba in our markets. On comparing the statistics[1] of importations for the past few years, this anxiety is not without foundation. The arrivals from direct sources of this commodity during 1891 amounted to 205,480 pounds; during 1892, amounted to 185,280 pounds; during 1893, amounted to 80,000 pounds; during 1894, amounted to 82,000 pounds; while the annual sales for consumption are estimated at 122,000 pounds. During the latter part of 1894 about 30,000 pounds of gurjun balsam arrived. At the request of Mr.

[1] From Messrs. Stallman and Fulton.

French, of Smith, Kline & French Company, I have investigated the questionable possibility of detecting gurjun balsam in balsam copaiba by the present methods.

Owing to the natural variable composition of balsam copaiba, its purity cannot always be ascertained with absolute certainty. If the variable composition of balsam copaiba was the only obstacle to surmount, our task would not be so difficult, but when we remember that it is practically impossible to secure this article from first hands (in this country only from third hands) we see how uncertain the genuineness of even a sample becomes from which reliable data can be secured. The tests, until recently, at our command, for detecting gurjun balsam in balsam copaiba, frequently made it impossible for the analyst to render an absolute decision as to its presence or absence when less than 25 per cent. was present.

Balsam copaiba is described as varying in color from a pale yellow to a brownish-yellow, is usually quite transparent, but there are varieties that always remain opalescent. Some kinds are occasionally slightly fluorescent. Samples have come into my hand, guaranteed genuine, and an examination proved them so, that were of a dark amber color and highly fluorescent. Balsam copaiba is insoluble in water, but soluble in absolute alcohol, ether, chloroform, benzine, carbon disulphide and fixed and volatile oils. It varies in specific gravity from 0·940 to 0·993 at 15° C.

In order to obtain the most reliable material possible, samples were obtained from several well-known dealers of this article; some were guaranteed pure, while others were represented to be of questionable purity.

Several samples of gurjun balsam were also secured. The dealers appeared somewhat reluctant to furnish this article, either because they were not in possession of it, or did not desire it to become known that they handled it.

The samples were all examined by the most approved methods, which are briefly reviewed below:

Turpentine.—When a sample of balsam is heated the odor of turpentine should not be emitted.

Fixed Oils.—The residue left after driving off the volatile oil should be transparent, friable and amorphous.

Paraffin Oil can be detected by introducing 1 c.c. of the balsam into a test tube containing 4 c.c. of 95 per cent. alcohol,

agitating the mixture well, then suspending the test tube in boiling water until the contents begin to boil; paraffin oil, if present, will separate from the mixture and sink to the bottom, while the balsam is held in solution or in suspension by the alcohol.

GURJUN BALSAM.—Hager's test is as follows: To 3 c.c. of a mixture of 1 part of sulphuric acid and 25 parts of pure acetic ether, add 6 drops of the balsam; after a few minutes the mixture will assume a violet hue, if a large per cent. of gurjun balsam is present, and on standing twelve hours it will change to a dark brown or black color.

A second test is as follows: Dissolve 1 drop of the balsam, to be tested, in 20 drops of carbon disulphide; to this mixture add 1 drop of a cooled mixture of equal parts of sulphuric and nitric acids, mix well. If gurjun balsam is present a red or violet tinge will appear.

GLACIAL ACETIC ACID TEST, due to Messrs. Dodge and Olcott, is executed thus: Place 1 c.c. of glacial acetic acid (99·5 per cent.) into a test tube; to this add 4 drops of pure, concentrated nitric acid (1·42), mix well; then add to this mixture, carefully, 4 drops of the balsam in question; if gurjun balsam is present, a reddish zone will be formed between the layer of balsam and the acid mixture in a few minutes. On mixing the contents of the test tube well, the whole will assume a reddish or purple color. The degree of color varies with the amount of gurjun balsam present.

ACID NUMBER.—A weighed portion of the balsam is dissolved in alcohol, a few drops of phenolphthalein solution added, and titrated with as eminormal solution of caustic potash. The number of mgms. of potassium hydroxide required to neutralize 1 gramme of the balsam is called the acid number.

THE AMMONIA TESTS.—All varieties of balsam copaiba, except para, when mixed with an equal volume of 10 per cent. ammonia water, will form a clear, transparent solution, more readily when warmed. Again, when 1 part of the balsam is mixed with 10 parts of 10 per cent. ammonia water, the resulting mixture should neither gelatinize nor separate a gelatinous substance, even after standing a day.

The accompanying table contains the results of the examination of the samples secured, as well as a few samples of pure balsam copaiba, adulterated by myself with gurjun balsam.

No.	Description.	Color.	Fluorescence.	Specific Gravity at 15° C.	Soluble in	Insoluble in	Turpentine.	Fl C
1	Pure.	Tinge of yellow.	None.	0·9384	E., B., CS_2, C. and F. and V. oils.	Water, AA. and Ma.	None.	Not
2	Pure.	Light yellow.	None.	0·9416	E., B., CS_2, C. and F. and V. oils.	Water, AA. and Ma.	None.	Not
3	Pure.	Dark amber.	Highly.	0·9808	E., B., CS_2, C. and F. and V. oils.	Water, AA. and Ma.	None.	Not
4	Pure.	Dark amber.	Highly.	0·9880	E., B., CS_2, C. and F. and V. oils.	Water, AA. and Ma.	None.	Not
5	Pure.	Dark amber.	Highly.	0·9830	E., B., CS_2, C. and F. and V. oils.	Water, AA. and Ma.	None.	-
6	Pure, Para.	Light yellow.	Very slight.	0·9499	E., B., CS_2, C., AA. and F. and V. oils	Water and Ma.	None.	-
7	Pure, Central America.	Light yellow.	None.	0·9624	E., B., CS_2, C., Ma. and F. and V. oils	Water and AA.	None.	-
8	Adulterated.	Amber.	Some.	0·9600	E., CS_2, C., Ma., AA. and F. and V. oils	Water and B.	None.	-
9	Adulterated.	Amber.	Some.	0·9572	E., CS_2., C., Ma., AA. and F. and V. oils	Water and B.	None.	-
10	No. 6, and 5 per cent. of gurjun balsam.	Light yellow.	Some.	0·9502	E., B., CS_2, C., AA. and F. and V. oils	Water and Ma.	—	-
11	No. 7, and 10 p. c. of gurjun balsam.	Light amber.	Some.	0·9603	E., CS_2, C., Ma. and F. and V. oils.	Water, AA. and B.	—	-
12	No. 7, and 15 p. c. of gurjun balsam.	Light amber.	Some.	0·9597	E., CS_2, C., Ma. and F. and V. oils.	Water, AA. and B.	—	-
13	Gurjun balsam.	Amber.	Highly.	0·9722	E., CS_2, C., AA. and F. and V. oils.	Water and B.	None.	-
14	Gurjun balsam.	Reddish.	Highly.	0·9528	E., CS_2, C., AA. and F. and V. oils.	Water and B.	None.	-

[1] Equal parts of ammonia water and balsam.
[2] Ten parts ammonia water, and one part of the balsam.

E = ether.
Ma. = meth

Turpentine.	Fixed Oils.	Paraffin Oil.	Ten Per Cent. Ammonia Test.	Hager's Test.	Sulphuric Acid, Nitric Acid and Carbon Disulphide Test.	Glacial, Acetic and Nitric Acids Test.	Acid Number.
None.	None.	None.	Soluble.[1] Normal.[2]	No action.	Colorless.	Colorless.	25·69
None.	None.	None.	Soluble. Normal.	No action.	Colorless.	Colorless.	34·62
None.	None.	None.	Soluble. Normal.	No action.	Colorless.	Colorless.	53·00
None.	None.	None.	Soluble. Oil separated.	No action.	Colorless.	Colorless.	62·10
None.	—	None.	Soluble. Oil separated.	No action.	Colorless.	Colorless.	62·35
None.	—	None.	Insoluble. Normal.	No action.	Colorless.	Colorless.	40·17
None.	—	None.	Soluble. Normal.	No action.	Colorless.	Colorless.	56·07
None.	—	None.	Insoluble. Oil separated.	Violet color.	Light purple.	Light purple.	35·09
None.	—	None.	Soluble. Normal.	No action.	Colorless.	Tinge of red.	40·92
—	—	—	Soluble. Normal.	No action.	Colorless.	Light purple.	38·26
—	—	—	Soluble. Normal.	No action.	Slight tinge of red.	Light purple.	50·65
—	—	—	Insoluble. Normal.	Very slight tinge of red.	Light red.	Light purple.	47·95
None.	—	None.	Insoluble. Gelat. ppt.	Purple.	Purple.	Purple.	38·88
None.	—	None.	Insoluble. Gelat. ppt.	Purple.	Purple.	Purple.	1·87

E. = ether. C. = chloroform. B. = benzine. AA. = absolute alcohol.
Ma. = methyl acetate. CS_2 = carbon disulphide. F. and V. = fixed and volatile oils.

The conclusions from the above and other data may be summarized as follows:

(1) The color and the fluorescence or non-fluorescence are of no value.

(2) The wide range of the specific gravity of balsam copaiba makes that factor practically valueless.

(3) The solubility or the insolubility of balsam copaiba are uncertain factors and cannot be relied on. One sample of pure substance is soluble in absolute alcohol, another is not. One sample of benzine will indicate the presence of gurjun balsam, another will not; hence, is valueless as a specific test.

(4) The specific tests for turpentine, fixed oils and paraffin oils are reliable.

(5) The ammonia tests are misleading and are consequently unreliable.

(6) The acid number cannot be relied on. At first the author anticipated valuable results from this source, but was utterly disappointed.

(7) Hager's test is not reliable, especially with less than 25 per cent. of gurjun balsam present.

(8) The carbon disulphide test is fairly reliable with a moderately large per cent. of gurjun balsam. Some varieties of balsam copaiba turn reddish-brown with this test, and it sometimes becomes very difficult to discriminate.

(9) The glacial acetic acid (99·5 per cent.) is perfectly reliable, even when not more than 5 per cent. is present, at least so far as the above results indicate.

The writer has found that gurjun balsam is even more variable in composition than balsam copaiba, consequently an absolute decision is reserved until a thorough test has been made with a fair number of samples. This will be done as soon as sufficient material can be collected.

The U. S. P. instructs us to detect gurjun balsam in balsam copaiba by heating a sample to 130° C., when it will gelatinize if the former is present. Some samples may gelatinize, but a trial proved that the material employed in these experiments increased only slightly in viscosity, not even assuming a semi-gelatinous state. The test is unreliable in toto.

Unless otherwise specified, the dealer will always supply a non-solidifiable product which will comply with every test in the U. S. P.,

and yet it is to be used only for mass copaiba. It seems almost absurd to prescribe a series of tests for a substance intended for a special purpose, and yet cautiously omit the test leading to its identification. A balsam copaiba designed especially for mass copaiba should be subjected to the solidification test.

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ON THE DETERMINATION OF MORPHINE IN OPIUM.[1]

BY LYMAN F. KEBLER, M.S.

In this article the author contributes some interesting and valuable information in regard to opium assaying, with especial reference to the several methods for obtaining corrections for the amount of impurity associated with the crude morphine.

The crude morphine from thirty opium assays was mixed, and a portion incinerated, a quantitative estimation being made of the ash. 27·88 per cent. of the ash was soluble in water, to which it imparted an alkaline reaction.

The complete analysis showed:

Soluble in H_2O (K_2CO_3, K_2SO_4, NaCl)	27·88
Silica	0·83
Aluminium phosphate	0·43
Magnesium phosphate	13·45
Calcium carbonate	56·17
Loss	1·24
Total	100·00

A comparison of the several methods for obtaining corrections, including titration with volumetric acid solution, using various indicators, gave the following results:

Methyl orange	100·02
Cochineal	99·53
Litmus	98·93
Brazil wood	98·47
Haematoxylin	97·59
Ash method	97·59
Lime water method	98·22
Absolute alcohol	98·33

[1] Read before the New York Section Soc. Chem. Ind., in April, and published in the May number of the Journal of the Society, page 464. Abstracted by Charles H. La Wall.

The author gives preference to the various methods in the following order:

(1) Ash method.
(2) Titration.
(3) Lime water method.
(4) Absolute alcohol.

A comprehensive series of assays was made from one sample of powdered opium, allowing the separation of the crude morphine to take place during periods of time ranging from three to thirty-six hours.

The tabulated results are as follows:

Number of hours allowed for precipitation	3	5	8	12	16	20	24	28	36
Per cent. of crude morphia in the opium	13·03	14·32	14·35	14·72	14·80	14·81	14·85	14·98	15·17
Per cent. of ash in the crude morphia	0·91	1·33	1·41	1·81	1·90	2·00	2·10	2·63	3·00
Per cent. of pure morphia in the crude morphia by the ash method. Based on the above analysis	98·54	97·34	97·35	97·63	96·65	96 28	96·10	95·06	94·45
Per cent. of pure morphia in the opium by the ash method. Based on the above analysis	12·84	13·94	13·97	14·22	14·28	14·26	14·27	14·24	14·32
Per cent. of pure morphia in the crude morphia by the lime-water method	99·10	98·01	98·21	97·32	96·70	96·40	96·31	96·02	96·21
Per cent. of pure morphia in the opium by the lime-water method	12·91	14·03	14·09	14·31	14·31	14·27	14·31	14·39	14·59
Per cent. of pure morphia in the crude morphia by titration	98·17	97·26	97·56	97·03	96·52	96·31	96·31	95·81	95·02
Per cent. of crude morphia in the opium by titration	12·78	13·92	13·99	14·28	14·28	14·26	14·30	14·35	14·41

According to the above table there is a decided increase both in impurity and morphine as time increases; also an appreciable augmentation is noted in the twelve-hour assay when compared with the eight-hour assay, which immediately precedes it.

The presence of meconic acid, potassium and calcium was established in morphine of three hours' precipitation, and, after appropriate experiments, the author concludes that the addition of the alcohol in the assay process hastens the precipitation of a part of the impurity.

The author thinks that a slight modification of the present process would yield a crude morphine needing no correction, *i. e.*, that the amount of impurity associated with the morphine would not exceed the amount of morphine lost during the operation.

The deposit which forms in the mother liquor, mixed with the wash water, rejecting the alcoholic and ethereal washings, was col-

lected from eight of the above assays after two months' standing. The weight of this precipitate showed an increase of 0·81 per cent. of morphine for the opium, but upon closer examination this precipitate was found to consist of but 54·43 per cent. pure morphine, the remainder being calcium meconate and organic matter.

After three months' standing, an aliquot part of the mother liquor and aqueous washings, free from any sediment, was treated according to Mr. Dieterich's process, and 0·15 per cent. more of morphine was obtained, making the total quantity for the given sample 14·81 per cent. pure morphine.

The author states that he considers a correction unnecessary for a well-executed assay; that is, allowing from twelve to sixteen hours for precipitation and adhering closely to the text, the amount of the crude morphine will not exceed the percentage of pure morphine in the sample.

THE TANNIN OF CINNAMOMUM CASSIA.

By Thomas R. Thornton, Ph.G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy. No. 145.

In a lecture on pharmacy delivered to the Senior Class of this College during the past winter, the lecturer stated that the nature of the tannin present in the variety of cinnamon under discussion at times interfered very much with the process of percolating the drug with aqueous menstrua, and occasionally rendered it almost impossible.

This statement induced the author to undertake the examination of the tannin that is recorded in this paper. But before commencing the investigation of the character of the tannin, it was decided to estimate the amount of the principle contained in the drug. For this purpose three samples of the drug were obtained, and from each lot a decoction was made by exhausting 20 grammes of the powdered article with enough hot water to make 1 litre of liquid when the latter was cool. The tannin contained in these liquids was then estimated by both the hide powder and the gelatin and alum methods, both of which have frequently been described in this Journal.

The following are the results which were obtained; they are stated in percentage and are based on the original drug:

Number of Sample.	Method of Estimation. Hide Powder.	Gelatin and Alum.
1	3·70	3·37
2	3·20	3·83
3	4·80	4·32

In order to isolate the tannin, a quantity of powdered cinnamon was exhausted by maceration and percolation with acetone. From the percolate the greater part of the solvent was recovered by distillation under reduced pressure.

To the concentrated liquid resulting from this operation, successive additions of water were made, until the resinous substances and associated matters were completely precipitated. The mixture was then filtered, the insoluble part set aside and the filtrate shaken with acetic ether, the object being to remove any tannin from the water solution. However, when the layer of acetic ether was separated and distilled there was but a very small residue left. This residue was of a resinous nature. To afford the acetic ether a better opportunity to extract the tannin from the water solution, the latter was saturated with sodium chloride. But a repetition of the agitation with acetic ether after this treatment did not serve to remove tannin.

Having cognizance of the possibility of a co-precipitation of the tannin with the resin of the drug when the concentrated acetone percolate was mixed with water, the author resorted to the precipitate which was produced by the addition of water, the insoluble part of the extract which he had set aside. This was dissolved in acetone, the solution diluted with water and afterwards saturated with sodium chloride.

The outcome of this treatment was a reddish-brown plastic mass, which separated in the layer of brine and a supernatant layer of acetone. The latter was removed, but no residue of tannin was obtained when the solvent was recovered.

This last described attempt to isolate the tannin having proved futile, it was decided to try the extraction of the tannin from the drug by the use of hot water—a solvent which would remove at most but mere traces of resin. Accordingly, a decoction was prepared in this manner. It was shaken with acetic ether, the mixture

at once saturated with sodium chloride, after which it was allowed to stand at rest for the acetic ether to separate. But no tannin was obtained when the layer of this solvent was removed and evaporated.

The failure of these methods to effect a solution of the tannin in water indicates clearly the phlobaphene character of that principle.

The fact that the astringent principle originally possessed this property of slight solubility in water, or acquires the same in the course of manipulation, seems alone sufficient to mark a relationship of the tannin of this species of cinnamon to that class of these compounds which are so well typified by the tannin of the oak barks; but that this relationship might be further inquired into, some of the insoluble substance, which was set aside, was dissolved in alcohol, and the deep wine-red solution which resulted was tested with the reagents named in the subjoined table.

The reactions given by the tannin of white oak bark and by gallotannic acid, when in water solutions, are supplied in the table, that the similarity of the tannin under consideration to the former and its dissimilarity to the latter may be the more manifest:

Reagent.	Cinnamon Tannin.	White Oak Tannin.	Gallotannic Acid.
Copper sulphate and Ammonium hydrate	Brownish-red ppt. Dirty-green ppt.	Precipitate. Brown-green color.	No ppt. Brown ppt.
Bromine water	Brownish-yellow ppt.	Yellow ppt.	No ppt.
Ferric chloride	Ppt., blackish-green color.	Green color and ppt.	Blue color and ppt.
Ammonio-ferric sulphate	Blackish-green ppt.	Green color and ppt.	Blue color and ppt.
Lime water	Ppt., turning brownish.	Ppt., turning pink.	Ppt., turning blue.
Lead acetate	Brick-red ppt.	Pale yellow ppt.	White ppt.

To learn the effect of the action of fused alkali on the tannin, some of the alcoholic solution of it was poured into water and the precipitate which was produced was collected on a filter, washed and allowed to drain. It was then added to fusing potassium hydrate, in which it dissolved with effervescence and the exhalation of a peculiar odor, one which was suggestive of that noticed in soap-making. After being allowed to cool, the mass was dissolved in distilled water. The solution was slightly acidified with diluted sulphuric acid, and without filtration agitated with ether U. S. P. The ether layer was removed and the sol-

vent recovered. The residue was treated with distilled water and the solution filtered. In order to further purify the product of the action of the fused alkali, it was removed from the last solution by agitation with ether, as before. The residue left upon the evaporation of the ether was dissolved in water, and in this solution the following reagents indicated the presence of protocatechuic acid.

Ferric chloride, green color, slight ppt.,
and
Sodium carbonate, red color.
Ferrous sulphate, in neutral solution, purple color and ppt.
Lead acetate, yellow ppt.; filtrate gave a slight ppt. with lead oxyacetate.
Ammoniacal silver nitrate, reduced.
Fehling's solution, reduced.
Lead oxyacetate, yellow ppt.
Pine wood and Hydrochloric acid, } No violet or red color (absence of phloroglucol).

The inference the author draws from this investigation is that the tannin principle of Cinnamomum Cassia is either a phlobaphene as it exists in the drug, or that it acquires a phlobaphene character when brought into contact with water. In either case, the presence of such compounds could be expected to contribute a large part of the difficulty experienced in percolating the drug with aqueous menstrua.

A NEW PROCESS FOR THE PREPARATION OF SOLUTION OF POTASSIUM ARSENITE, U. S. P.

By Andrew Campbell, Ph.G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy. No. 146.

With the object of practically ascertaining the value of a suggestion of Garraud, in the *Bulletin de la Société de Pharmacie de Bordeaux*, in regard to a rapid method for the preparation of Fowler's solution, the experiments described below were undertaken by the author.

But before taking up the consideration of the proposed method, it might be well to review the methods which have been so long in vogue, so that their features will be fresh in mind.

The official method of the United States Pharmacopœia of 1890 for the preparation of solution of potassium arsenite, is to boil 10

grammes of arsenous acid and 20 grammes of potassium bicarbonate with 100 c.c. of water, until solution is effected, when cold, water is added to make 970 c.c., and then 30 c.c. of compound tincture of lavender.

It is to be noted in this formula that the amount of potassium bicarbonate is double that of the Pharmacopœia of 1880. The weight directed by the present authority practically agrees with the quantity required for a reaction, which may be represented thus:

$$\underset{197.68}{As_2O_3} + \underset{399.52}{4KHCO_3} = 2K_2HAsO_3 + 4CO_2 + H_2O$$

The view generally taken, however, as to the nature of the arsenical salt present, is that it is a mono-potassium arsenite, the reaction being:

$$\underset{197.68}{As_2O_3} + \underset{199.76}{2KHCO_3} + H_2O = 2KH_2AsO_3 + 2CO_2$$

And with the quantities required for this reaction those which were stated in the Pharmacopœia of 1880 practically coincide.

It is, of course, well understood that neither of these reactions are fully realized, and upon testing a volume of 20 c.c. of a freshly-made official solution (in the production of which .400 gramme of potassium bicarbonate had been used) in a carbon dioxide apparatus for excess of carbonate undecomposed by the action of the arsenous acid, a loss of .115 gramme of that gas was experienced. The same process was carried out, with varying results, upon solutions which had been kept for longer periods, but the evidence was abundant proof of the fact that solution of the arsenic trioxide can take place even before boiling has converted all of the potassium bicarbonate into carbonate.

Garraud's recommendation consists in the use of potassium hydrate instead of the potassium carbonate directed by the French Codex, or the purer salt, potassium bicarbonate, ordered in the United States Pharmacopœia.

The reactions would then be expressed as follows:

$$\underset{197.68}{As_2O_3} + \underset{223.96}{4KOH} = 2K_2HAsO_3 + H_2O$$

or,

$$\underset{197.68}{As_2O_3} + \underset{111.98}{2KOH} + H_2O = 2KH_2AsO_3$$

By the first of these reactions, 10 grammes of arsenous acid would require 11·329 grammes of potassium hydrate, while by the second 5·665 grammes would be needed, in both cases the amounts being calculated by proportion. Since the potassium hydrate of the market is of uncertain strength, the definite weight required cannot be adjusted without resorting to a valuation of the article. In view of this existing condition, a convenient way to supply the necessary quantity of the alkali would be to add the requisite amount in the form of a solution of known strength, as, for example, a normal volumetric solution (55·99 grammes of KOH in 1,000 c.c).

If a normal volumetric solution was to be used, 10 grammes of arsenous acid would require, for the fulfilment of the reactions, 202 c.c. and 101 c.c., respectively.

That the reaction involving the smaller amount of alkali might be accomplished, 10 grammes of arsenous acid were added to 101 c.c. of normal potassium hydrate volumetric solution, in which it dissolved completely on slight agitation, and without the necessity of applying heat. To this solution was added sufficient water to make 970 c.c., and then 30 c.c. of compound tincture of lavender. The product of this rapid and easy method was correct in arsenical strength, this fact being established by the results of an application of the pharmacopœial process of estimation, while in physical appearance and stability it was identical with the product of the official directions. An objection which may be urged against the general use of this process is that, although it is easy and rapid, the average pharmacist may not have at hand the apparatus necessary for adjusting a potassium hydrate solution to a known strength. But any such difficulty can be obviated by making use of the official liquor potassæ, instead of the normal volumetric solution, in which to dissolve the arsenous acid. The strength of liquor potassæ is stated by the Pharmacopœia to be about 5 per cent., and that of the normal volumetric solution is practically 5·6 per cent. When 10 grammes of arsenous acid were added to 100 c.c. of liquor potassæ, it was found to dissolve as readily as did the same amount in 101 c.c. of the normal volumetric solution.

In order to determine the limit of this ready solubility an excess of arsenous acid was added to some liquor potassæ, the mixture agitated for a few minutes and then filtered. Five cubic centimetres

of the filtrate were titrated with decinormal iodine volumetric solution in the presence of an excess of sodium bicarbonate. This volume was found to contain .699 gramme of arsenous acid. In the same proportion 10 grammes of arsenous acid would require 71·5 c.c. of liquor potassæ. The difference between this amount and that indicated above (100 c.c.) would amply allow for any defect in the strength of the liquor potassæ, and would insure the complete solution of the arsenous acid under all circumstances.

The arsenous acid used should, of course, be pure and, as generally recommended, that in mass should be obtained and powdered as required, for the best samples of commercial powdered arsenous acid were found during the course of these experiments to be only of about 93 per cent. purity.

In connection with this subject eight commercial samples of Fowler's solution were examined by the pharmacopœial method of assay. Two of the samples were from an inland city, five from retail druggists of Philadelphia, and one from a wholesale drug house of the same place.

The results are indicated in the amount of decinormal iodine volumetric solution required by the official method of estimation, and also in percentage comparison with the official requirement of arsenous acid.

Number.	C.c. of $\frac{N}{10}$ Iodine Solution.	Percentage Comparison.
1	48·8	98·79
2	48·7	98·64
3	48·1	97·42
4	48 6	98·44
5	45·0	91·14
6	49·0	99·24
7	498·9	998 28
8	50·2	100·40

These figures were all verified by duplicate titrations, and in the case of No. 7 recourse was had to a gravimetric determination of the arsenous acid to insure accuracy.

The excessive and dangerous strength of this sample is significant in showing that too much care cannot be exercised in the manufacture of even the galenicals of the Pharmacopœia.

The arsenous acid being present in practically ten times the proper amount leads to the suggestion that the error may have occurred in an attempt to translate from the metric to the customary system, in the absence of a proper outfit of metric weights and graduates.

NOTES ON SOME SAPS AND SECRETIONS USED IN PHARMACY.

By P. L. Simmonds, F.L.S.

[*Concluded from p. 328.*]

Pinus species. Very many species of *Pinus* yield volatile oils used in pharmacy. Among others, *P. palustris*, Ait, or *P. pinaster*, *P. Tæda*, *Pinus sylvestris*, Lin., *P. Pumilio*, Hank., the *P. Mugus*, Scop., and others.

Pinus Abies, Lin., *P. Picea*, Du Roi, *P. vulgaris*, *Abies excelsa*, Dec., the silver fir.—This species furnishes the oleo-resin known as Strasburg turpentine, which resembles common turpentine, but has a more agreeable odor.

P. balsamea, Lin., *Abies balsamea*, Marshall, *A. balsamifera*, Michx —The balsam fir yields the well-known oleo-resin, Canada turpentine, which is exported from Quebec in kegs or large barrels. Canada balsam is used for medicinal and manufacturing purposes. It is an ingredient in blistering paper and flexible collodion. It is highly valued and much employed as a menstruum for mounting microscopic objects, and makes a fine, transparent varnish for water-color drawings, which does not become darker with time.

P. Australis, Michx., *P. palustris*, Mill.—This is the most valuable of all the American pines. From it are obtained the American "Thus," the concrete turpentine, the volatile oil from turpentine, and the resin. There are three principal descriptions of turpentine known in commerce, American, Bordeaux and Russian. Bordeaux, from *P. pinaster*, Ait.; Russian, from *P. sylvestris*, Lin.; Chian, from *Pistacia Terebinthus*, Lin.

P. Canadensis, Lin., *Abies Canadensis*, Michx. and DeC.—The hemlock spruce furnishes the concrete turpentine known as Canada pitch, which is official in the United States. It is slightly stimulant, like Burgundy pitch, and employed for similar purposes. A volatile oil is obtained from the leaves, which produces dangerous

effects. The inner bark, being a powerful astringent, is used medicinally in America, but its chief application is for tanning. The young shoots are used in making spruce beer.

Turpentine is the general name for the oleo-resinous exudations of coniferous trees, which flows in the crude state from incisions made in the stems. The turpentines, as a rule, are yellowish-white, very viscid, transparent or translucent masses, of honey consistence and of acid reaction; of a peculiar, strong, mostly unpleasant odor, and generally of a burning, aromatic, bitter, disagreeable taste; they consist chiefly of resin and volatile oil. When distilled, this oleo-resin yields the volatile oil or "spirit of turpentine." England imports from 420,000 to 520,000 cwt of oil of turpentine, in barrels of 2 to 3 cwt., chiefly from the Southern States. Its medicinal properties are stimulant, diuretic, occasionally diaphoretic and anthelmintic. In large doses, purgative, sometimes causing nausea, vomiting and intoxication. Previous to 1846, the tariff of Great Britain was such as to exclude imports of spirits of turpentine and resin.

Turpentine especially affects the kidneys and the mucus of the genito-urinary organs. Externally rubifacient, employed as a liniment in chronic affections. The yellow, translucent resin, the residue of the distillation of the turpentines, is important as an ingredient of plasters and ointments, which are employed as stimulant applications to indolent and ill-conditioned ulcers.

Picea vulgaris, Link., in the north of Europe, furnishes a quantity of resin, from which different products are obtained, among others, pitch. From *Larix Europæa* is obtained the resinous extract known as Briancon, or Venice turpentine, employed in consumption.

From *P. pinaster*, Ait., *P. maritima*, Poir. and Dec. (the cluster pine), Galipot is obtained, also known as "Barras." It is employed, like American "Thus," in the preparation of certain plasters. The annual production from a tree ranges from 5 to 8 pounds.

P. religiosa, H. B. K.—The turpentine produced by this tree is similar in properties to the Venice turpentine. The local name of this tree in Mexico is Oyatmetl.

P. sylvestris, C. Bauhin.—Tar is procured by the destructive distillation of the fir in Northern Europe and America. That used in North America is chiefly obtained from *P. palustris*, Mill. (*P. Aus-*

tralis, Michx.). The tar obtained in Europe is generally considered superior to that of America. The imports of tar into the United Kingdom were, in 1892, 132,000 barrels, and in 1893, 102,216 barrels, of about 30 gallons each. Tar acts as a stimulant, diuretic and diaphoretic, but is not much employed in medicine. It may be used internally in chronic catarrhal affections, and complaints of the urinary passages, also for some chronic skin diseases. Tar water used to be popular in England as a medicinal drink, and in France in most of the Duval and other cheap restaurants, gallons of "Eau de Goudron" are drank daily.

A kind of barrillin is prepared from the cambium sap of this pine. An oily substance, called "fir-wool spirit," has been introduced from Germany, recommended for external use in rheumatism, neuralgia, etc.

P. Larix, Lin., *Abies Larix*, Lamarck., *Larix Europæa*, Dec.—Larch bark is considered to be stimulant, astringent and diuretic. This tree furnishes Venice turpentine, the properties and uses of which are the same as those of the other turpentines.

P. nigra, Ait., when tapped, yields the essence of spruce, an infusion of which, with the leaves and branches, in water, sweetened with molasses, makes the chowder, or black beer, used by the fishermen of Newfoundland as an antiscorbutic.

P. Picea, Du Roi, *P. Abies*, Lin.—The resinous exudation from the spruce fir, commonly known as Burgundy pitch, is obtained chiefly in Finland and the Black Forest. It is a useful application as a plaster to the chest in chronic coughs and other pulmonary affections, to the loins in lumbago, and to the joints in rheumatism.

P. Taeda, Linn.—The oldfield, or frankincense, a fine American pine, furnishes similar products to *P. sylvestris* and *P. Australis*. It yields turpentine in good quantity, though of inferior quality, and exudes much resin.

P. Teocot, Schlecht.—The Brea turpentine produced resembles that of Bordeaux. It yields 17 per cent. of essential oil. The tree abounds in the mountains that surround the valley of Mexico, and in some other localities in that country. Its local name is Ocoto.

Pistacia Lentiscus, Lin.—This and *P. Atlantica* furnish the gum resin of commerce known as mastic. The largest consumption is in the east of Europe, where it is universally chewed like chicle gum in America, and thence derives its popular name. The women

of Scio, Smyrna and Constantinople have almost always a piece of mastic in their mouths. It is asserted to be effectual in whitening the teeth, strengthening the gums, and sweetening the breath. Hence it is used by dentists, and also the inferior kinds for making varnishes, and is one of the ingredients in fumigation. It is obtained in the Greek archipelago, by making incisions in the bark of the tree. When good it occurs in pale yellow, brittle, transparent drops, of an astringent taste, slight agreeable odor, especially when heated. Such as inclines to black, green, or is dirty, should be avoided. The principal revenue of Chios, or Scio, is derived from this gum resin, of which some 4,000 to 5,000 cwt. are obtained. The picked first quality is sent to Constantinople, France and Austria, in small cases. Very little comes to England, only a few cases. The second and third qualities are used in the manufacture of mastic raki, a liqueur made with spirit, mixed with pulverized mastic, which is boiled and cooled. About 200,000 gallons of this are exported annually from Scio.

Pistacia Terebinthus, Linn.—The Chian turpentine of commerce was obtained from this tree in Scio. The produce was under 1,000 lbs. a year. As a medicine it is now obsolete. It is chiefly used in Greece and other parts of the Levant, for preserving wine, and flavoring the spirituous cordial called Raki.

A resinous gum called Alk or Lik (whence the word Lac), flows so abundantly from the trees, even without incision, in Algeria, that it is often dangerous to sleep under them. It is supposed that this tree would yield good terebinthine.

The resins of Algeria are those from the teribinth cedar, juniper, *Pinus halepensis*, Mill. (of which there are large forests), *Thuya articulata*, Vahl., sandarac and mastic.

Pluchea balsamifera, Less. *Blumea balsamifera*, Dec. *Conyza balsamifera*, Lin.—This Eastern shrub has diaphoretic and expectorant properties, in lung diseases. It is the source of a kind of camphor known as Ngai, exported from the Chinese port of Hoïhow, in the island of Hainan, to the extent of about 15,000 lbs. annually. The crude camphor is refined at Canton, and is then known as Ngai-pün, and about 10,000 lbs. are exported yearly from Canton.

Plumeria phagadæmia, Mart.—The milky juice is used in the Amazon valley of Brazil as a vermifuge, administered in coffee, with castor oil. It is also applied externally in rheumatism, and for the cure of ulcers, boils, dislocations, etc.

Populus balsamifera, Linn.—The leaf buds of this species, and of *P. nigra*, Lin., are gathered for medicinal purposes. Their resinous secretion is said to be diuretic and antiscorbutic. It is used to prevent rancidity in ointments, but paraffin is equally effectual.

Mimusops globosa Gaertner, Chicle gum, exudes from this and another species in Mexico, and is largely collected, being used in the United States for chewing. The exports from Mexico in 1892 were to the value of over $476,000.

Prosopis dulcis, H. B.—Mezquite is used in the preparation of mucilage, gum-drops, jujube-paste, etc. The gum, which exudes from the trunk and branches, is very soluble in water, and forms, when dissolved, a demulcent of a sweet, creamy and agreeable taste, but souring more readily, and probably containing a larger proportion of tannic and gallic acid than gum arabic.

There are vast forests of the mezquite trees, embracing millions of acres, in the southwestern part of Texas. The process of gathering the gum is simple. The outside bark of the tree is scraped off, and the gum begins to exude and form in icicle-shaped masses, and, after one day's exposure in the autumn, is dry and hard enough to collect. Its color, however, unfits it for pharmaceutical purposes.

Prunus spinosa, Lin.—The acid, astringent juice of the fruit (the sloe), inspissated over a slow fire, has been used in France as a substitute for catechu. The leaves have that peculiar flavor which exists in *Spiræa ulmaria*, the American *Gaultheria*, and some other plants, which resembles the more delicate perfume of green tea, and hence they were said to be used as adulterants of tea. A water distilled from the blossoms is used as a medicinal vehicle in some parts of the continent.

Pterocarpus marsupium, Roxb. The reddish gum resin which exudes from the bark of this tree forms one of the best kinos of commerce, containing about 75 per cent. of tannic acid, and has been known in Europe for upwards of a century. It is the dried sap which exudes copiously, on the stem being artificially wounded. It becomes brittle on hardening, and is very astringent. It is exported in considerable quantities from Malabar. Another kind of kino is from *Butea frondosa*. Nearly all the Australian *Eucalypti* exude astringent gum resins in considerable quantity, resembling Kino in appearance and property. Kino is commonly used in

medicine for its astringent properties, especially in diarrhœa, chronic dysentery and other such cases.

P. Santalinus, Lin.—The essential oil of nosandus wood, or "sandalwood," as it is sometimes called, is prescribed for gonorrhœa. This tree also yields a kind of dragon's blood.

Rhus Metopium, Lin.—This tree is known in the West Indies as the false hog gum tree. From the bark, when wounded, a transparent juice exudes, which is used on plasters as a substitute for Burgundy pitch, also in medicine as a substitute for balsam of copaiba. The milky juice of some other species of Rhus, especially of *R. radicans*, Lin., a variety of *R. Toxicodendron*, Michx, is exceedingly poisonous.

Saccharum officinarum, Lin.—One-half of the sugar now made in the world is produced from beet root, which, however well prepared, is inferior to that obtained from the sap of the sugar cane. The latter alone is prescribed in the Pharmacopœias; it is demulcent, given in catarrhal affections, in the form of candy, syrup, etc. It is also employed in pharmacy to render oils miscible with water, and enters into the composition of several mixtures and pills, and all the confections, syrups and lozenges.

Molasses is the drainage from raw or muscovado sugar. It is sometimes sold as "golden syrup." Treacle, which is darker and thicker, is that which drains from refined sugar in the moulds. Treacle is slightly laxative, and is used in pharmacy to give cohesiveness to pill masses. To persons disposed to dyspepsia and bilious habits, sugar in excess becomes more hurtful than otherwise. Sugar, when concentrated, is highly antiseptic, and, from a knowledge of its possessing this principle, it is frequently employed in the preservation of vegetable, animal and medicinal substances. In cases of poisoning by copper, arsenic, or corrosive sublimate, sugar has been successfully employed as an antidote; and white sugar finely pulverized is occasionally sprinkled upon ulcers with unhealthy granulations.

Salix tetrasperma, Roxb.—At the commencement of the hot season in India, the upper surface of the leaves of this tree are occasionally covered with a sugary exudation, which dries up in thin white flakes to a sugar or manna. The same trees often yield this exudation several years in succession, but it appears to be confined to a few trees and is not common. Two or three other species of

Salix have also been observed to yield a saccharine exudation—*S. fragilis*, in Persia; *S. Chilensis*, in Chili, and a species in the Punjab.

Styrax benzoin, Dryand.; *Benzoin officinalis*, Hayne; *Lithocarpus Benzoin*, Blume.—Benzoin, known in commerce as "Gum Benjamin" is an odoriferous or balsamic gum resin, an exudation from the stem of trees in Siam and Sumatra, and imported in small chests of 2½ cwts. These two qualities are chiefly used in medicine; the one in tears from Siam, and the other, in agglutinated masses from the far East. The former is the purest and has the strongest odor. Its medicinal properties are stimulant, expectorant and styptic. It is used also in perfumery, for incense, and in making aromatic pastilles, coating court-plaster and for healing wounds.

The imports into London were, in 1891: 3,464 chests; 1892, 2,655 chests; and in 1893, 3,163 chests. Benzoin was formerly employed in chronic bronchitis and dysentery, but is now chiefly used in the tincture known as "friar's balsam," as a styptic and stimulant to wounds and old ulcers. Benzoic acid is stimulant and diuretic, and also a valuable antiseptic.

Tabashur, a word of Sanscrit origin; Tavakshiri meaning cow's milk. This secretion is procured from the joints, or internodes, of the female bamboo, *Bambuso arundinacea*, W. It so far resembles silex as to form a kind of glass when fused with alkalies. It is also unaffected by fire and acids. It is called "bamboo salt," and is employed medicinally in the East as a tonic and astringent in the cure of all sorts of paralytic complaints, flatulencies and poisons. This hydrate of alumina is often found in the soil where a plantation of bamboos has been burnt. P. Smith gives the following analysis of its composition:

Silica	90·50
Potash	1·10
Peroxide of iron	0·90
Alumina	0·40
Water	4·87
Sap	2·23
	100·00

Beesha Rhudii, Kunth. (*Melocanna bambusoides*, Tim.), yields more or less of the Tabashur; sometimes, it is said, the cavity is nearly filled with this silicious crystallization.

Toluifera balsamum, Lin.; Myroxylon *Toluifera*, H. B. K.; *Myrospermum toluiferum*, A. Rech.—There are many other synonyms of this tree.

There is great confusion yet as to the origin of the two balsams, Peru and Tolu. The exudation known as "balsam of Tolu" is obtained by incisions in the trunk. When in the first state it is thickish, yellow, becomes slowly darker and solid, and has a very pleasant odor and an agreeable taste. It is chiefly obtained in New Granada, and exudes only from the tree during the heat of the day. The tree inhabits the mountains and banks of the River Magdalena. The balsam, which contains cinnamic acid, is used as a stimulant expectorant, and for flavoring by confectioners and perfumers. It is largely imported into the United States, the imports averaging 42,000 pounds in the three years ending 1890. In the form of lozenges it is a popular and agreeable remedy for appeasing troublesome coughs, and gives a pleasant odor to lip salve.

Toluifera Pereiræ (Roxb.) Baillon; *Myroxlon peruiferum*, Lin. *fil.*; *Myrospermum Salvatoriense*.—This balsam tree, like Tolu, has received many synonyms from different authors. The balsam is a beautiful tree, averaging 100 feet in height and 20 inches in diameter. It grows almost exclusively on the coast of Salvador, comprised by the southern shores of the departments of Sonsonate and Libertad. It is known locally as quinquino, or white balsam, when first obtained, but this name is also given to a balsam from the pressed fruit. It is a transparent deep reddish brown, or black liquid, similar in color and consistence to dark molasses, smells vanilla-like, but somewhat empyreumatic, tastes a little bitter, sharp and burning.

There are two methods of extracting the liquid. The first consists in scraping the skin of the bark to the depth of one-tenth of an inch with a sharp machete in small spaces some twelve to fifteen inches square, all along the trunk and stout branches of the trees. Immediately after this operation, the portions scraped are heated with burning torches made out of the dried branches of a tree, and after this pieces of old cotton cloth are spread on the warmed and half-charred bark. By punching the edges of the cloth against the tree with the point of the machete, they are made to adhere. In this condition they are left for twenty-four and even forty-eight hours, when the rags are gathered and submitted to a decoction in

large iron pots. After this the rags are subjected, while still hot, to great pressure in an Indian machine made of strong ropes and wooden levers worked by hand. The balsam oozes out and falls into a receptacle, where it is allowed to cool. This is called raw balsam. To refine it they boil it again and drain it, after which they pack it in iron cans ready for market. The other method of extracting balsam consists in entirely barking the trunk and heavy branches of the tree, a process which, as a rule, kills it outright, and at best renders it useless for several years. The bark is finely ground, boiled and submitted to pressure in order to extract the oil, which is considered of an inferior quality to that obtained by the system first described. Both methods are defective, but the latter is ruinous, and is forbidden by the authorities. The name of "Peruvian balsam" was given to this article because it was first sent from Salvador to Peru, in the time of the Spaniards, and from Callao reshipped to England.

About 6,000 pounds of the balsam go to the United States annually. Thirty years ago, many thousand pounds of it were received in England, but the imports there rarely exceed now 2,000 pounds. It is a warm and stimulating tonic and expectorant, useful in chronic catarrh, asthma and other pectoral complaints and rheumatism. Externally it is much used in Europe, in the treatment of scabies, as being equally effective, and more agreeable than sulphur in its application.

The balsams of Tolu and Peru are employed occasionally medicinally in the state of syrup or tincture, particularly in cough mixtures; their fragrance also renders them pleasant adjuncts to chocolate, liqueurs and other articles.

Balsam of Peru is seldom met with in commerce unadulterated. The best test is its specific gravity, which ought to be between 1·14 and 1·16. The difficulty of taking the specific gravity is best overcome by making a solution of one part of chloride of sodium in five parts of water, the specific gravity of which is 1·125. In this liquor a drop of Peru balsam, if pure, ought to sink down. (Other tests were given in Vol. 66, p 100.)

Uncaria Gambir, Roxb. *Nauclea Gambir*, Hunter.—This plant yields the extract known as pale catechu in pharmacy, which is largely imported into Europe from Singapore, under the commercial name of Gambier, and frequently under the old erroneous designa-

tion of "Terra japonica." It is like cutch, a powerful astringent, useful chiefly in diarrhœa. Lozenges are said to be the best medium of administering it in relaxed condition of the throat, uvula and tonsils, in sponginess of the gums, salivation, etc. They may be employed in pyrosis and other cases in which astringents are indicated. This extract contains only about half the astringent matter of that obtained from the trunk of *Acacia Catechu*. (Tests to determine the two are given, Vol. 66, p. 105.).

The exports from Singapore average over 40,000 tons, of which more than half comes to England, to be chiefly used by tanners and dyers, and about 13,000 tons to the United States.

Unona Narum, Dun.; *Uvaria Narum*, Bl.; *U. Zeylanica*, Lam.—A greenish, sweet-smelling oil; is obtained in Malabar by distilling the roots of this evergreen climber, which is used medicinally as a stimulant in rheumatism. The seeds are carminative.

Vateria indica, Lin.; *Elæocarpus copallinus*, Retz.—The resin from this tree is the white dammar, or Indian copal, known also as "piney varnish." Under the influence of gentle heat, it combines with wax and oil, and forms an excellent resinous ointment.

Xanthorrhœa Tatei, Mueller.—This, one of the largest of the so-called "Australian grape trees," furnishes the "black-boy gum," a balsamic resin of a bright yellow color and pleasant fragrant odor, when burned as incense. It is used for the manufacture of sealing wax, and picric acid (which it yields in large percentages), and for varnishes. It is also known as "gum acroides." It tastes slightly astringent and aromatic, like storax or benzoin, containing benzoic and cinnamic acids. This resin is also commercially obtained from *X. resinosa*, Persoon; *X. quadrangulata*, Mueller, of South Australia; *X. Preissic*, Endlicher, of West Australia, and *X. hastilis*, and *X. Australis*, R. Brown, of New South Wales.

NOTES ON THE COMMERCE IN VEGETABLE OILS.

By P. L. Simmonds, F.L.S.

All plants do not yield oil, but still the list of oil producers is an extensive one. The richest are the cruciferous tribe, and some of the palm fruits. All oils are not good for food or light, some of them being what are termed "drying oils."

The quantity of oil yielded varies, not only in different species, but according to climate and culture. Roughly it may be assumed that oily nuts yield half their weight; colza seed two-fifths; hemp seed one-fourth, and linseed from one-fourth to one-fifth.

Some oils are employed for food, others are burned in lamps; some form the basis of soap, or are used as lubricants, not to mention their employment in painting, in perfumes and many other economic purposes.

In the manufacture of woollens from 10 to 15 per cent. of oil is required. For the finer kinds of wool, olive and ground-nut oils are used, while for the coarser kinds rape is employed.

The largest source of vegetable oils is the small seeds of plants, and some of them are used for food. The seed of the cotton plant, gingilie, mustard, linseed and rape seed may be quoted as illustrations of those products, and oils of a very fine quality are procurable from them. The seeds of the common cucumber and those of other cucurbita may be especially cited as yielding an edible oil of delicious and delicate taste, and that of the large cucumber, grown on the slave coast, far exceeds in flavor the finest olive oil.

Seed oil is more commonly eaten in India and other hot countries than in England. The seeds of the safflower and the sesamum oils may be added to the list, as representing Indian oils, which are used in cooking grain and other vegetables; whilst in the gloomy forests of Central Africa and in the great mangrove swamps, where the cassava, plantain and yam are the chief foods, palm oil and vegetable fats are almost necessaries of life.

In a work which I helped Dr. Edward Smith to bring out some years ago, "On Foods," he observes: "There can be no doubt that we have in this product of seeds of plants, which seem otherwise to be useless, a great storehouse of most valuable nutritive material; and if we know but little of many of them in this climate, it is because we have the olive oil at hand, and are bountifully supplied with many kinds of animal fats. It is, however, probable that the cheapness of some of these vegetable oils, in addition to the delicacy of their flavor, will, ere long, force themselves into notice and obtain a place among our foods."

In China there are a number of edible oils used which do not appear in English commerce, and they have even some mode of purifying castor oil to remove its drastic properties. The enormous

demand for oil there, as an article of daily diet, to counteract the binding qualities of rice and other cereal foods in pastry-making, etc., has led to the manufacture of oil from all sorts of sources.

Vegetable fixed oils are usually contained in the seeds of plants, though olive oil and palm oil are extracted from the pulp which surrounds the stone. They are commonly of a thickish consistence and unctuous feel, and differ from volatile oils in leaving a greasy stain on paper, which cannot be removed by heat alone. They are sometimes colorless, occasionally of a greenish or yellowish hue; when pure, semi-transparent, with little smell and a mild taste.

Fixed oils are those which require an intense heat before they give out vapor. The fixed vegetable oils are chiefly expressed, the seeds or raw material being previously ground or bruised, and the pulpy matter subjected to pressure in hempen bags; a gentle heat being generally employed at the same time, to render the oil more liquid. Those which retain their transparency after they have become solid, as linseed, nut, poppy and hemp seed, are called *drying oils*, while others which assume the appearance of tallow or wax and become opaque, as olive, almond, rape and benne are called *fat oils*.

The former are mostly used for paints, varnishes and printers' ink; the latter are consumed as food, in medicine, soap-making and other branches; several of each kind being likewise extensively employed in the arts and in the lubrication of machinery. The division of oils into drying and non-drying is due to the oleine which alters in oxidizing. The product of this alteration is, in non-drying oils, an acid of a disagreeable odor, which irritates the throat; in the drying oils it forms an actual resin.

India and Africa are the chief producing countries of oil-yielding plants. There are over 300 plants known in India to yield oils or perfumes, while those of many other countries also furnish fixed or volatile oils, Some are, however, not articles of any commercial importance.

The port and town of Marseilles, from its facilities for obtaining supplies from Africa and India, is regarded as the principal European centre for oil-crushing and the utilization of oils.

The receipts of oil seeds and their manufacture at Marseilles, in 1887 and 1893, were as follows, in metrical quintals of 2 cwt.:

	1887.		1893.
	Oil Seeds.	Oil Made.	Oil Seeds.
Ground-nuts	785,280	265,000	1,225,290
Castor	214,090	88,000	12,820
Colza	43,830	5,700	54,100
Copra	71,650	109,000	466,340
Cotton	235,950	46,800	182,170
Linseed	75,400	20,500	108,430
Mowra (*Basin*)	52,000	19,300	120,390
Niger	6,850	2,050	19,940
Palm-nuts	300,000	132,000	188,060
Poppy seed	46,050	17,000	36,890
Ravisons (Mustard)	12,780	600	12,000
Sesame	878,630	396,000	1,188,460
Other seeds and oleaginous fruits	47,050	—	208,900
	2,867,660	1,121,400	3,803,790

The stock of oil seeds on hand at the end of the year 1892 was	35,000	metrical quintals.
Received in 1893	3,803,790	" "
	3,838,790	" "
Deducting the stock in hand at the close of 1893,	40,000	" "
	3,798,790	" "
The mills at Marseilles crushed	3,260,000	" "
Being an excess over 1892 of	538,270	" "
These oil seeds produced	151,195,000	kilogrammes of oil.
To which has to be added imported from various countries, which represents a total of	12,698,000 / 163,893,000	" "

The average imports of oil at Marseilles, in each of the five years ending 1893, was 27,643,400 kilogrammes, and the average annual exports in the same period was 38,923,200 kilogrammes (of $2\frac{1}{5}$ pounds) per annum.

The progress of the trade in oil seeds and oil at the port of Marseilles has been enormous in the last twenty-five years, and has advanced from 184,986 tons of all kinds in 1870, to 380,279 tons in 1893, of 20 cwt.

The fixed or expressed oils imported into the United States were, in 1890, 20,323,677 pounds free, valued at $1,437,216, and of other oils, dutiable, 687,797 gallons, value, $417,388. In 1894, olive oil was imported to the extent of 21,173 gallons, value, $23,262, and

other fixed oils, 45,470 gallons, value, $28,308, dutiable. The volatile or essential oils imported in the States in the last ten years were:

	Pounds.	Dollars.
1885	4,594	10,184
1886	3,536	19,917
1887	2,220	6,546
1888	4,820	7,776
1889	53,374	10,375
1890	19,707	10,018
1891	74,972	12,765
1892	19,080	10,233
1893	80,320	16,931
1894	16,862	9,252

The exports from China were fixed oils (which include benne oil, ground-nut, tea seed and wood oils), as follows, in piculs of 133⅓ pounds:

	Fixed Oils.		Volatile or Essential. (Aniseed, Cassia Leaf, etc.)	
	Piculs.	Value.	Piculs.	Value.
1889	43,390	£61,000	2,074½	£51,943
1890	49,643	70,680	2,207½	55,153
1891	44,589	62,109	2,174½	62,300
1892	44,062	55,551	3,168	83,045
1893	152,069	200,557	2,273½	57,623
1894	196,928	162,965	2,685½	75,688

From British India the fixed oils exported are chiefly castor oil, 3,000,000 gallons yearly; cocoanut oil, 1,500,000 gallons; a small quantity of til, or gingilie (sesame), 250,000 gallons, and of other kinds of oil, about 300,000 gallons. The volatile or essential oils exported from India are now about 18,000 gallons, valued at £44,000.

The specific gravity of oils has been carefully determined, and is of some consequence. To be of value, the specific gravity should be carefully taken at a temperature of 60° Fahr. The oliometre should be marked with ordinary specific gravity degrees, water being 1,000, and the face allowed on the stem for each degree should not be less than one-tenth of an inch. As a rough rule, 1° of gravity may be substituted for every 2½ per cent. excess of temperature above 60° Fahr.

MINERAL AND METAL PRODUCTION OF THE UNITED STATES IN 1893 AND 1894.

The following statistics of mineral products of the United States, which are of especial interest to pharmacists, are taken from a compilation by Richard P. Rothwell, and published in *The Engineering and Mining Journal*, June 1, 1895 :

Products.	Customary Measure.	1893.		1894.	
		Quantity.	Value at Place of Production.	Quantity.	Value at Place of Production.
Corundum and emery	Short tons.	1,747	$140,589	1,220	$109,500
Tripoli and infusorial earth	"	1,351	25,625	1,802	36,687
Alum	"	96,000	2,880,000	72,000	2,160,000
Antimony ore	"	850	41,000	165	9,075
Asbestos	"	120	6,000	250	3,750
Fibrous talc	"	36,500	337,625	39,600	396,000
Talc and soapstone	"	20,100	366,825	21,044	401,892
Barytes	"	26,632	133,160	23,758	95,032
Bauxite	Long tons.	19,041	55,205	10,732	42,928
Borax	Pounds.	9,199,000	689,925	13,140,589	919,841
Bromine	"	348,399	87,100	379,444	98,655
Cobalt oxide	"	3,894	5,452	6,550	8,843
Copperas	Short tons.	17,862	134,520	14,897	104,100
Copper sulphate	Pounds.	54,000,000	1,822,500	60,000,000	2,016,000
Chrome ore	Long tons.	1,629	16,000	2,653	35,125
Graphite	Pounds.	882,912	39,731	770,846	34,689
Gypsum	Short tons.	330,231	927,615	287,517	849,925
Lime	Barrels, 200 lbs.	60,000,000	30,000,000	56,750,000	28,375,000
Magnesite	Short tons.	1,143	8,000	1,370	4,864
Manganese ore	Long tons.	9,150	60,000	11,735	74,890
Paints, mineral	Short tons.	44,709	726,160	38,801	662,262
Paints, white lead	"	88,500	9,469,500	87,242	8,445,174
Paints, zinc oxide	"	25,000	1,875,000	22,814	1,711,275
Petroleum, crude	Barrels, 42 gals.	50,349,228	32,223,505	48,527,336	40,762,962
Phosphate, rock	Long tons.	981,340	3,434,690	952,155	2,856,465
Salt, evaporated	Barrels, 280 lbs.	9,703,419	4,945,583	9,161,053	4,608,275
Salt, rock	"	1,935,642	678,064	2,341,922	788,681
Soda, natural	Short tons.	2,500	12,500	—	—
Soda, natural sulphate	"	90	450	—	—
Aluminum	Pounds.	312,000	202,800	817,600	490,560
Antimony	Short tons.	350	63,000	220	39,200
Copper	Pounds.	327,255,788	35,179,997	353,504,314	33,540,489
Gold	Troy ounces.	1,739,323	35,955,000	1,923,619	39,761,205
Iron, pig	Long tons.	7,043,384	93,888,309	6,657,388	71,966,364
Lead, value at New York	Short tons.	166,678	12,434,178	160,867	10,585,048
Nickel, fine	Pounds.	25,893	12,429	—	—
Quicksilver	Flasks, 76½ lbs.	30,164	1,108,527	30,440	1,095,840
Silver, commercial value	Troy ounces.	60,500,000	47,311,000	49,846,875	31,403,531
Zinc, spelter	Short tons.	76,255	6,214,782	74,000	5,209,882

All of the mineral products of the country are not given in the above table, but only those which have some pharmaceutical interest. The total value of all the mineral products of this country amounted in 1893 to $615,896,806, and in 1894 to $553,272,902, showing a decrease in values last year of $62,573,904, or 9 per cent.

The silver production of the United States was maintained at a much higher level than had generally been expected. In 1893 the production was 60,500,000 ounces, a decrease of 4,500,000 ounces from 1892, when it reached its highest level. The low price with which 1894 opened, and the withdrawal of the

artificial demand created by the Sherman law, led many persons to believe that the reduction would approximate the amount of the Government purchases under that law, or 54,000,000 ounces, which would have been equivalent to practically wiping out the industry. The actual decrease in 1894 was only 10,654,000 ounces, or about 18 per cent. The reduction still leaves the United States the greatest silver producer of the world, and the industry is, and will doubtless continue to be, a most important one.

THE HISTORY OF PARAFFINED PAPER IN AMERICA.

Paraffined paper is an American improvement on waxed paper, which was an English invention. This waxed paper was made by dipping sheets of paper into melted beeswax. Such a treatment rendered the paper impervious to moisture and grease, and in England the product found some application in pharmacy, and perhaps in other arts.

The first use made of waxed paper in America was by William Hodgson, who conducted a pharmacy at Tenth and Arch Streets, Philadelphia. This occurred in 1854. Mr. Hodgson had learned the usefulness of the article from John Bell, the well-known English pharmacist. Mr. Hodgson used the paper between spread plasters for the purpose of preventing their sticking together. Although paper so prepared had long been known to writers upon scientific subjects, it found but this limited application in pharmacy and probably less use in other arts until 1865. But about this time the true value of a commodity possessing its properties was commencing to be appreciated.

Until the year mentioned waxed paper was prepared only by those who found it applicable in their own enterprises. But the increasing consumption of the article suggested to the firm of Mellor & Rittenhouse, of Philadelphia, the idea of manufacturing it for sale. To Mr. H. N. Rittenhouse, who was at the time a member of that firm, but who is now an uninterested party, we are indebted for the data of this history. At this juncture we have an example of the ingenuity of American pharmacy. Paraffin was about this time beginning to claim some of the attention which it has since been found to merit. Suspecting in that substance the properties that contributed to the peculiar advantages possessed by waxed paper, this firm decided to substitute paraffin for the more costly beeswax with which to impregnate the paper. This they did, and, aside from the important feature of difference in cost, the greater beauty of

the paper saturated with paraffin was considered to be sufficient to favor the use of that substance. The first application of their product was to prevent the sticking together of plasters, and then to such uses as the wrapping of articles that required the exclusion of moisture, or that were to avoid contact with oily substances.

The experience of these parties proved the new product to be capable of replacing the old, and, for the last two purposes mentioned, paraffined paper is, at the present time, considered as almost indispensable. It rapidly replaced waxed paper, but retained its name, so that what is intended to-day, when waxed paper is called for, is almost invariably the product prepared with paraffin.

Shortly after its introduction its adaptability to the uses cited attracted the attention of confectioners, to whom the first sales were made. By them the paper was used for wrapping candies. The annual sales of the article at that time amounted to not more than $150. In 1868, the originators of it exhibited samples of their manufacture at the annual meeting of the American Pharmaceutical Association, which was held in the Philadelphia College of Pharmacy. This exhibition not only served to direct attention to the article and to demonstrate its value as applied, but also suggested new uses for it.

The process of manufacture that was at first employed by the originators of the use of paraffin consisted of impregnating with that substance sheets of paper spread upon heated surfaces. This plan was followed until the greatly increased demand for the product rendered such methods inadequate. Accordingly, in 1877, these manufacturers invented a machine whereby the production could be more readily accomplished, and at the same time a company was organized for the purpose of developing what gave unmistakable evidence of becoming a business of itself.

As the product was never patented, nor its preparation held a secret, several firms quietly adopted the idea. They not only prepared it for their own use, but very probably also for sale, for, when at last the paper was recognized as a regular article of manufacture, competition was attracted to it from all sides. Various machines for its production were patented, and for ten or twelve years almost incessant litigation for alleged infringement followed as the consequence. After spending much money and experiencing many disappointments in the delays and decisions of the courts, the litigants

finally concluded to harmonize and form a trust or some agreement whereby peace should prevail. Thus, from being a product of only a few hundred dollars' worth at the outset, paraffined paper has become a staple article, at least $400,000 worth now being annually consumed. In 1889 there were, in various parts of the United States, six concerns, with an invested capital of $100,000 to $200,000, engaged in the manufacture of paraffined paper.

MERCURIC CHLORIDE IN THE TREATMENT OF RHUS POISONING.

BY A. F. WITMER, M.D.

I would call attention to the value of corrosive sublimate in the treatment of dermatitis venenata. Permit me to cite a case.

D. L., aged 28 years, is very susceptible, direct contact with the plant not being necessary to induce a violent eruption. He has yearly attacks of a severe type, frequently lasting for six weeks. He applied for treatment in the early part of May with the typical eruption on the face and fingers. The patient was given one-thirty-second of a grain of mercuric chloride every three hours. Within four days the eruption had entirely disappeared. The topical application consisted of lead water and laudanum, during the acute stage; of hot water, frequently applied, during the stage of exudation, and of a two per cent. carbolated petrolatum ointment during the stage of desquamation.

This case is of interest owing to the rapid convalescence of the patient during a time when the toxic plant (rhus) is particularly virulent.—*Phila. Polyclinic*, June 29, 1895.

NEW YORK STATE PHARMACEUTICAL ASSOCIATION.

The first session of this Association was held at Saratoga, N. Y., Tuesday, June 25, 1895. The following papers were read:

"Fluid Extract of Wild Cherry," by G. V. Dillenbach; "Recent Additions to Our Materia Medica," by R. G. Eccles; "Modern Pharmacy," by Thomas J. Keenan. The last constituted the report of the Committee on Pharmacy and Queries.

The officers elected were: G. J. Seabury, President; L. A. Baker, D. L. Cameron and E. S. Smith, Vice-Presidents; Clay W. Holmes, Secretary; W. B. Fuller, Treasurer; W. L. Du Bois, P. W. Ray and Thomas Stoddard, Executive Committee.

NEW JERSEY PHARMACEUTICAL ASSOCIATION.

The twenty-fifth annual meeting of this Association was held at Newark, N. J., May 22 and 23, 1895.

The most noteworthy communication was on "The Pharmacology of Saw-Palmetto," by H. H. Rusby, W. H. Bastedo and Virgil Coblentz.

EDITORIAL.

THE UNIVERSAL TRADE ASSOCIATION AND THE PENNSYLVANIA PHARMACEUTICAL ASSOCIATION.

The "Universal Trade Association" is a corporation located at Detroit, whose avowed object is to unite all the retail druggists of the United States and Canada into one stock company, with a capital of $1,000,000.

When organization has been completed, by securing thirty thousand of the forty thousand druggists of America, the business of the corporation will be to correct the abuses which exist in the retail drug business, notably the "cutting of prices" in patent medicines.

Of the merits or demerits of this proposed "plan," we are not disposed to speak, but any corporation or "trust" that is proposing to raise $1,000,000 from the retail druggists of America should carry itself so far above the suspicion of sharp practice as to absolutely prevent the slightest reflection on its character.

The following communication will show, however, that the conduct of the aforesaid corporation towards the Pennsylvania Pharmaceutical Association has not been such as to win for it the confidence of the members of the latter body:

Editor AMERICAN JOURNAL OF PHARMACY.

SIR:—I notice in the *June* issue of *The Retail Druggist*, the organ of the "Universal Trade Association," a corporation having its headquarters in Detroit, that the Pennsylvania Pharmaceutical Association, at its last meeting in Eagle's Mere, in June last, gave an unqualified indorsement of the "Universal Trade Association" by the adoption of the following resolution:

"Having heard the details of the objects of the Universal Trade Association for the protection of the trade interests of the retail druggists of the United States and Canada, that we hereby express our approval of the same and strongly recommend the retail druggists of the State to join the Association with a view of promoting its universal adoption by manufacturers, wholesalers and retailers."

The publication of this resolution, after the action taken by the Pennsylvania Association, puts the Universal Trade Association, to say the least, in a very unfavorable position before the drug trade of the country, and will damage them in the estimation of all right-thinking persons. It is true this resolution was passed at one of the sessions, and only because, without the knowledge of the meeting, its author had induced Dr. Charles A. Heinitsh, an old and honored member, to present it. In such esteem is Dr. Heinitsh held, that it was not seriously opposed. After the action was taken, it was felt by many that there had been too much haste; that nothing was known of the "Universal Trade Association" other than the representations made by its agent, and that to give the unqualified indorsement of the Pennsylvania Pharmaceutical Association to a plan of which the members knew absolutely nothing, was a great mistake. Hence, at the very next session, less than three hours afterwards, the action was reconsidered with but one or two dissenting votes and the "Universal Trade Association" plan was thoroughly discussed. The agent, who was a member of the Association, was entitled to all the privileges of the floor.

He tried to answer the arguments which were presented against the adoption of the resolution and to prevent any unfavorable action being taken, for which he is to be commended, but failed. Instead of indorsing the "Universal Trade Association," the following action, altogether very different in character, was taken:

"We heartily approve of the organization of an exclusive retail drug association, or any plan or plans which may be indorsed by the American Pharmaceutical Association, or a majority of the State pharmaceutical associations, looking to the amelioration of the condition of the drug trade."

After the adoption of this resolution, the agent of the "U. T. A." moved to have all previous action and the discussion relative thereto expunged from the proceedings, to which the Association would not agree.

In view of this falsification of the records of the Pennsylvania Association, what explanation will the "Universal Trade Association" make to the retail druggists of the country? How can it sustain itself before the thinking public? Let it answer.

J. H. REDSECKER.

LEBANON, PA., July 13, 1895.

It will not clear the "U. T. A." to say that the second resolution, as passed by the Pennsylvania Pharmaceutical Association, was also published in *The Retail Druggist*. Nor can it plead lack of time, for if there was time to print the second resolution there was also time to leave the first one out.

We presume this corporation will have agents at the Denver meeting of the American Pharmaceutical Association, and it will not be in accordance with its past policy if these agents do not have some well-known member to present a "cut and dried" resolution of indorsement.

There have been many well-matured "plans" presented to the suffering pharmacists of America during the past few years, but all of them have failed. This last one has the assurance to ask for an amount of money that is equivalent to an average of $25 from every druggist of the country, then it will begin business and commence to declare dividends. One of the first arguments of an agent is: "You have been crying for deliverance, and now when you have the opportunity offered, you are too pessimistic to take advantage of it."

THE PHARMACEUTICAL JOURNAL.

The first number of Volume I, fourth series, of this time-honored and successful publication has reached us. It has attained the fifty-fifth year of its existence, with its energy in no way impaired.

Under the title of "Pharmaceutical Transactions," it was originally published by Jacob Bell, to record the transactions of scientific meetings held by Bell and other members of the Pharmaceutical Society.

On turning back in the AMERICAN JOURNAL OF PHARMACY to 1841, page 301, we find the new Journal welcomed in the following words:

"Not the least gratifying evidence of the spirit with which the active members of the Association[1] have entered into the cause is the establishment of the monthly scientific journal, before referred to, bearing the title of 'Pharmaceutical Transactions,' of which we have the first four numbers before us.

"It is edited by Jacob Bell, an active and able member of the Council, and published for the present by him, on his own responsibility, as an experiment; although it is, no doubt, to

[1] The Pharmaceutical Society of Great Britain.

be considered as the organ of the society, and will be officially adopted as such, when the institution becomes fully organized. It contains the proceedings of the society, the papers read at the scientific meetings, pharmaceutic and general scientific intelligence, etc.

"We observe in it extracts from our own journal, and in return present in the present number selections from it, and, as its only collaborateur in the same language, we heartily bid it welcome."

The first series of the Journal extended over eighteen years. In 1859, on the death of Bell, Redwood, who had assisted him, continued as editor in conjunction with Bently and Barnard, thus forming the second series, extending over eleven years. Then, shortly after the passing of the Pharmacy Act, in 1868, the issue of a weekly publication, as a third series of the Journal, was decided upon to meet the increased demand for information, more or less directly interesting in connection with pharmacy.

One year after founding the Journal, Bell gave it the title of "Pharmaceutical Journal and Transactions." With the beginning of the present series the title has very appropriately become "The Pharmaceutical Journal." The first number of the new series appeared on July 6th, with an enlarged page and with some seventy-eight pages of advertisements and a supplement of trade notes of eight pages. The whole is a magnificent exhibition of the enterprise of the editor and of the condition of the pharmaceutical profession in Great Britain and the Colonies that will absorb 7,000 copies of such a publication weekly.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

DIE GERICHTLICH-CHEMISCHE ERMITTELUNG VON GIFTEN IN NAHRUNGSMITTELN, LUFTGEMISCHEN, SPEISERESTEN, KORPERTHEILEN, ETC. Von Georg Dragendorff. Fourth edition. Göttingen, Vandenhoeck and Ruprecht. 1895. Pp. 532.

There is probably no better work in any language on the chemistry of poisons than this one, which has now reached its fourth edition.

The author presents the subject in a clear and logical manner. The introduction gives general rules for the investigation for poisons, and treats of such subjects as exhuming, taking of samples and the presence of antiseptics and embalming fluids. In the special part, the various poisons are considered in a systematic manner, beginning with the *halogens* and *strong acids*, and then treating of *poisonous gases*, *volatile poisons*, as phosphorus, chloroform, alcohol, ether, benzol, ethereal oils, etc., *alkaloids*, *glucosides*, *non-alkaloidal substances*, as cantharidin and digitalin, the *heavy metals*, and, finally, the alkalies and alkaline earths.

While the non-metallic portion is exhaustively treated, it is in the consideration of the vegetable poisons that Professor Dragendorff especially excels. He knows whereof he writes, because of his practical study of the subject, and not by quoting some other writer, although his citation of references is very complete.

A full index and a table of blood spectra complete this valuable work.

FORMULAIRE DES SPÉCIALTIÉS PHARMACEUTIQUES. Par M. Gautier et F. Renault. Paris. J. B. Baillière et Fils. 1895. Pp. 298.

This book belongs to a series of useful volumes, issued by the same publishers during the past few years. Unlike its predecessors, however, this one appears to have little in it of value to the pharmacist. It purports to give the composition, therapeutic indications, mode of administration and dose of a number of pharmaceutical specialties that have but little excuse for their existence, except that they have been so persistently brought to the attention of physicians, and their presumed superiority over official preparations so conspicuously set forth that the medical practitioner has been induced to prescribe them.

We are told, in the opening paragraph of the preface, that "pharmaceutical specialties are being more and more prescribed by physicians; the practitioner desires a remedy that is sure, easy to order without complicated formula, of constant composition, and not exposed to the difficulties or errors of the official preparations." In other words, the official preparations are slurred, and the physician is told in plain English (or rather French), that since he is too intolerably lazy and ignorant to do more than write his own name, all the rest is done for him.

The composition of the remedies is given in a vague sort of a way, that precludes any one from knowing what is contained in them, and the whole savors strongly of some American price-lists, containing about as much information, except that no price is given. There is one exception to the usual beclouded statement of composition, and that is *dermatol*, for which a working formula is given.

TABULAR REVIEW OF ORGANOGRAPHY. Prepared for the use of the classes in botany of the Department of Pharmacy, University of Buffalo. By A. L. Benedict.

This pamphlet, of twenty pages, has been prepared for use in connection with Bastin's College Botany. It is intended to be used by the student in his field work; and alongside of the numerous headings, blank space is left to be filled in by the student.

ÉTUDES DES PLANTES DES COLONIES FRANÇAISES. Par Henri Bocquillon-Limousin. Paris. A. Hennuyer, 1895. Pp. 94.

The author has previously communicated information on this subject, and the present pamphlet is devoted to the colonial plants having febrifuge properties. Each plant is considered in the following systematic order: *Synonym, habitat, part employed, botanical characters, anatomy, chemical composition, therapeutic properties* and *dose*. Under chemical composition the results of the author's own investigations are usually given. The whole is an interesting and valuable contribution to economic botany.

VIERTELJAHRESSCHRIFT ÜBER DIE FORTSCHRITTE AUF DEM GEBIETE CHEMIE DER NAHRUNGS-UND GENUSSMITTEL. Zehnter Jahrgang. Erstes Heft. Berlin, 1895. Verlag von Julius Springer.

TRANSACTIONS OF THE ACADEMY OF SCIENCE OF ST. LOUIS.—Vol. VI, No. 18.—*Proceedings and Index.*

Vol. VII, No. 1. *A Study of the Unionidæ of Arkansas, with Incidental Reference to their Distribution in the Mississippi Valley.* By R. Ellsworth Call.

Vol. VII, No. 2. *On the Electrical Capacity of Bodies, and the Energy of an Electrical Discharge.* By Francis E. Nipher.

Vol. VII, No. 3. *Note on the Glacial Drift in St. Louis. Note on the Occurrence of Blende in Lignite. Recent Additions to the Mineralogy of Missouri.*

NOTIZEN ÜBER HYDRIRTES CINCHONIN, HYDROCHLORCINCHONIN UND HYDROCHLORAPOCINCHONIN. NOTIZEN ÜBER EINIGE CHINAALKALOÏDE. Von O. Hesse. Reprints from *Berichte der Deutschen Chemischen Gesellschaft.* Berlin, 1895.

CATALOGUES.

TENTH ANNUAL ANNOUNCEMENT OF THE BUFFALO COLLEGE OF PHARMACY. Buffalo, N. Y.

TWENTY-FOURTH ANNUAL CIRCULAR OF THE NATIONAL COLLEGE OF PHARMACY. Washington, D. C.

UNIVERSITY OF TENNESSEE, MEDICAL DEPARTMENT, Nashvillle, Tenn. Announcement, 1895–96.

ANNUAL ANNOUNCEMENT OF THE NEW JERSEY COLLEGE OF PHARMACY. Session of 1895–96. Newark, N. J.

MASSACHUSETTS COLLEGE OF PHARMACY. Twenty-ninth Annual Catalogue, 1895–96. Boston, Mass.

PROSPECTUS OF THE COLLEGE OF PHARMACY OF THE CITY OF NEW YORK, 1895–96.

SALE-CATALOGUE OF THE LIBRARY OF THE LATE PROFESSOR JOHN M. MAISCH. Address Mrs. C. J. Maisch, 753 North Fortieth Street, Philadelphia, Pa.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The forty-third annual meeting will convene at Denver, Col., commencing on Wednesday, August 14, 1895, at 3.30 P.M.

Hotel Accommodations.—Headquarters of the Association will be at the Brown Palace Hotel. Rates reduced from $6 to $3 for members of the American Pharmaceutical Association and their friends. The "Windsor" and the "Albany," both also first-class hotels, have reduced their rates to $2 per day. For quarters, address Mr. E. L. Scholtz, Local Secretary, American Pharmaceutical Association, Denver, Col.

Proposals for membership should be sent to the Secretary of the Committee, Geo. W. Kennedy, Pottsville, Pa., not later than August 7th, or after that date may be addressed to him at Denver, Col., care of the Brown Palace Hotel. For further information address the Chairman of the Committee on Membership, Dr. H. M. Whelpley, 2342 Albion Place, St. Louis, Mo.

Reports and essays intended for use at the coming meeting should be sent at once to the chairmen of the respective sections, viz: Scientific Papers, Dr. A. R. L. Dohme, Baltimore, Md.; Education and Legislation, Prof. James M. Good, St. Louis, Mo.; Commercial Interests, Mr. Geo. J. Seabury, New York, N. Y.

Credentials of delegates should reach the Permanent Secretary at least two weeks in advance of the meeting, as provided by Chapter VIII, Article 5, of the By-laws. Those sent later should be addressed in care of the Local Secretary, Mr. Edm. L. Scholtz, Denver, Col.

A session of the Council will be held at the Brown Palace Hotel, on Wednesday, August 14th, at 9.30 A.M., for the purpose of arranging the business of the Association in compliance with Chapter VI, Article 6, of the By-laws.

TRAVELLING ARRANGEMENTS.

Particular attention is directed to the following information furnished by the Committee on Transportation.

Rates.—The Western, Southern and Central Passenger Associations have made a rate of one fare for the round trip from all points in their territories, covering the entire section lying west of a line drawn through Toronto, Canada, Buffalo, N. Y., Parkersburg and Charlestown, W. Va. East of this line is the territory of the Trunk Lines Association; on June 11th they refused to consider our application for a rate. On June 25th they made us a rate of one and one-third fares for the round trip. Following the favorable action of all the other passenger associations, this seems an extraordinary procedure, and there is reason to think that in a few days it will be favorably reconsidered. We shall then have half rates from practically every point in the United States and Canada east of the Rocky Mountains. It is with regret the committee announce their utter failure to get any concessions for members on the Pacific Coast.

The Missouri Pacific Railroad has announced an extension until September 1st, on the return portion of tickets over their line. Other lines will doubtless follow with similar announcements, and thus all visitors be enabled to enjoy the benefits of such extension.

ROUTES.

While members are at liberty to select whatever route they may choose, the following have been recommended by the committee:

FROM THE EAST.

Leave Boston via Fall River Line, or by any preferred route, so as to make connection with the party which will leave New York as follows:

Leave	New York	via B. & O.,	Friday, August	9th,	6 P.M.
"	Philadelphia	" "	" "	"	8.23 P.M.
"	Baltimore	" "	" "	"	10.50 P.M.
"	Washington	" "	Saturday, "	10th,	12.01 A.M.
Arrive	Cincinnati	" "	" "	"	5.30 P.M.
Leave	"	" "	" "	"	8.15 P.M.
"	Vincennes	" "	Sunday, "	11th,	2.38 A.M.
Arrive	St. Louis	" "	" "	"	7.12 A.M.
Leave	St. Louis	via Mo. Pac.,	Monday, "	12th,	9.00 A.M.
"	Jefferson City	" "	" "	"	1.05 P.M.
"	Sedalia	" "	" "	"	3.00 P.M.
Arrive	Kansas City	" "	" "	"	6.00 P.M.
Leave	"	via Union Pac.,	" "	"	11.00 P.M.
Arrive	Denver	" "	Tuesday, "	13th,	5.00 P.M.

The lay-over of twenty-six hours in St. Louis has been arranged for so as to enable the party to see something of that city. At Kansas City an informal reception is to be tendered the visitors by the local pharmacists.

FROM CHICAGO.

Leave Chicago	via Santa Fé R. R.,	Sunday,	August	11th,	5.00 P.M.
" Kansas City . . .	" "	Monday,	"	12th,	9.00 A.M.
" Colorado Springs	" "	Tuesday,	"	13th,	8.30 A.M.
Arrive Denver	" "	"	"	13th,	11.00 A.M.

A stop-over of one day at Colorado Springs, including a trip to Manitou and other resorts, is contemplated by those taking this route, resuming the journey to Denver the day following, arriving in ample time for the first session of the Association.

R. J. Brown, of Leavenworth; George Leis, of Lawrence, and C. E. Corcoran, of Kansas City, are a committee appointed by the chairman to look after the comforts of those who travel this route.

Sleeping Cars.—One berth will accommodate two persons, though more comfortable for one:

New York	to Denver	price per berth,	$11 00
Baltimore	"	" "	11 00
Washington	"	" "	11 00
Cincinnati	"	" "	8 00
St. Louis	"	" "	5 50
Chicago	"	" "	6 00
Kansas City	"	" "	3 50

Mr. C. A. Mayo, 37 College Place, New York City, will receive applications for berths to St. Louis from parties leaving New York and other Eastern points on August 9th.

Mr. W. J. M. Gordon, 710 Plum Street, Cincinnati, and Mr. N. R. Warwick, 131 Vine Street, Cincinnati, Agent of the Missouri Pacific Railway, will do similar service for those desiring reservations at Cincinnati.

Special arrangements for Pullmans will be made at St. Louis by the Missouri Pacific, and at Chicago by the Santa Fé Railroad. Those wishing sleeping car reservations at St. Louis should address H. C. Townsend, General Passenger Agent, Missouri Pacific Railway, or Dr. H. M. Whelpley, 2342 Albion Place.

Those wishing them at Chicago should address Geo. T. Nicholson, General Passenger Agent, Atchison, Topeka and Santa Fe Railroad, or Mr. A. E. Ebert, 426 State Street.

At Kansas City, Mr. J. B. Frawley, Agent Union Pacific System, and Mr. Geo. W. Hagenbuch, Agent Santa Fé, will cheerfully attend to any commissions intrusted to them.

How to Return.—A choice of any direct route from Denver will be permitted returning; choice to be designated at time and place of purchasing ticket.

Members from the east of Parkersburg may return via the Denver and Rio Grande to Pueblo, and thence via the Missouri Pacific to St. Louis or via Kansas City and Chicago.

Members from Chicago who go out over the Santa Fé are recommended to return via Union Pacific to Kansas City and thence to Chicago on the Santa Fé.

While the above are recommended there are other excellent routes which the members are at liberty to select.

TICKETS.

Selling Days.—At Chicago and St. Louis and Western points, August 11th and 12th; at all points farther East tickets will be sold August 9th, 10th and 11th, but not to reach Chicago or St. Louis prior to August 11th or later than August 12th.

How to Purchase Tickets.—Members outside the territory of the Trunk Line Association (see paragraph on rates) can purchase at any regular ticket office a *round trip ticket* to Denver for one first-class fare. The return route must be designated at the time of the purchase of these tickets. Where the tickets themselves are not on sale, a partial ticket will be issued with an exchange order for the remainder of the ticket, which is to be presented at a specified ticket office. Tickets are good going only on date of sale as stamped on the back and for continuous passage to Colorado. After reaching Colorado stop-overs will be allowed 'either going or returning' at Pueblo, Colorado Springs and Denver. Members convenient to the Baltimore and Ohio can purchase tickets through the nearest member of the Committee. Those residing in the Trunk Line Association territory, and not convenient to the B. & O., may either purchase tickets on the "association plan," paying one and one-third fares for the entire round trip, or may purchase round trip tickets at the regular rate to the nearest point in the territory of the Central Traffic Association (see paragraph on rates), and at this point purchase a round trip ticket for one fare.

Any further information may be obtained from the members of the Transportation Committee.

CHARLES M. FORD, *Chairman*,
700 Fifteenth Street, Denver, Col.
CASWELL A. MAYO,
37 College Place, New York.
S. A. D. SHEPPARD,
1129 Washington Street, Boston, Mass.
W. J. M. GORDON,
710 Plum Street, Cincinnati, O.
H. M. WHELPLEY,
2342 Albion Place, St. Louis, Mo.
HARRY SHARP,
Marietta and Walton Streets, Atlanta, Ga.
A. E. EBERT,
426 State Street, Chicago.
L. F. CHALIN,
Carrolton and St. Charles Avenues, New Orleans, La.
WM. M. SEARBY,
400 Sutter Street, San Francisco, Cal.
CHAS. CASPARI, JR., *Permanent Secretary;*
109 Aisquith Street, Baltimore.

July 17, 1895.

OBITUARY.

Silas Maineville Burroughs, Ph.G.

Silas Maineville Burroughs, Ph.G., Class of 1877, was born in Medina, N. Y., in 1850, and died at Monte Carlo on Wednesday, February 6, 1895, of pneumonia, aged 45 years.

He received his early education in his native State, after which he entered the employ of Mr. E. T. Coann, at Albion, N. Y., as an apprentice to the drug business, remaining two years, and afterwards held positions in the drug stores of T. J. Chadwick, Lockport, N. Y., and S. H. T. Champlen, of Buffalo, N. Y. He came to Philadelphia and attended the Philadelphia College of Pharmacy, with Dr. E. P. Healy as his preceptor, and passed the examinations in March, 1877, number 22 in his class. His thesis was entitled, "Compression of Medicinal Powders." After his graduation he represented the firm of John Wyeth & Bros. for many years, and left the firm to establish himself in business in London, England.

His business career, as is well known, was characterized by untiring energy, and with a determination to succeed, no matter what obstacle might seemingly arise to interpose.

A few years ago he associated himself with Henry S. Wellcome, Ph.G., Class of 1874, under the firm name of Burroughs, Wellcome & Co., of which he was the senior member. With the aid of Mr. Wellcome, he established a very large and lucrative business, not only in Great Britain, Europe and America, but in all the British colonies of Asia, Australia and Africa.

He was well known throughout the pharmaceutical globe, having made two trips around the world, visiting all the prominent centres of pharmacy in each country.

He was a man of very liberal ideas and broad-minded views upon political matters, particularly the "Single Tax." Notwithstanding many differed from him in his extreme views, he was respected and honored for his straightforward manliness and courage, and for the honesty of his convictions.

His friendship was greatly appreciated by those who knew him best, for he was a man of generous heart, and had a sympathizing nature. Our Alumni Association has lost one of its most able and progressive members, one with whom it was an honor to be associated, as was attested at the annual meeting of the Alumni Association, held on Monday afternoon, April 15, 1895, when Prof. Joseph P. Remington, after making a few feeling remarks in reference to the great loss our Association and the pharmaceutical cause had sustained, offered the following resolutions, which were unanimously adopted, viz.:

"Whereas, The Alumni Association of the Philadelphia College of Pharmacy have heard with feelings of profound sorrow of the death of Silas Maineville Burroughs, Ph.G., of London, Eng.; be it therefore

"*Resolved*, That in the death of our fellow-member, while bowing in submission to the Divine will, we deeply deplore the loss of one who labored so assiduously for the benefit of his fellow-man, and although his voice will never more be raised in our midst, his example will ever be cherished as full of encouragement and help for every member of this Association.

"*Resolved*, That we tender our heartfelt sympathy to the family of our deceased member, and also to his business partner and fellow-alumnus, Henry

S. Wellcome, Ph.G., and that a copy of these resolutions be forwarded to them." W. E. K.

Frederick Brown, Ph.G.

Frederick Brown, Ph.G., Class 1861, was born in Philadelphia, December—, in 1837, died suddenly at his summer residence, which was built by his father, in 1848, in Burlington, N. J., on Tuesday morning, September 25, 1894, of pneumonia, in his fifty-seventh year.

He was the eldest son of Frederick and Charlotte Augusta Hoppin Brown. His father was born in 1796, and was the original manufacturer of Brown's Jamaica Ginger, and founded the business in 1822, at the northeast corner of Fifth and Chestnut Streets (the old stand which was universally known as the "War Office," because of the building being used by the war department during the Presidency of Washington and Adams).

Frederick Brown, Jr., received his education first at the Episcopal Academy and afterwards at the University of Pennsylvania. After his early education was finished he entered his father's store and learned the drug business, and attended the Philadelphia College of Pharmacy, graduating with the Class of 1861, and after graduation he continued in his father's store for a short time; but being desirous of conducting a store of his own, he shortly afterwards rented a store on the southeast corner of Ninth and Chestnut Streets, under the Continental Hotel, and opened up business for himself. He remained here about two years, or until 1864, when he gave it up and re-entered the store of his father, who died a month later, when he inherited the business. He made many improvements in the store, and continued the business until 1889, when he removed the store to 127 South Fourth Street, and in 1890, desiring to devote his entire time to the manufacture of the essence of Jamaica Ginger, he sold the store to Charles G. Dodson, Ph.G., Class of 1859, who had been associated with him in the management of the drug portion of the business since the death of his father. Mr. Brown was then free to devote himself to the manufacture of his preparation, which he had been doing for some time previous, and with which his name had been identified.

In June, 1865, he married Miss J. E. Wills, of New Haven, Conn., who survives him, with three sons and a daughter.

Mr. Brown was not a society man, but preferring to spend his unoccupied time from business with his family in the house.

He was connected with St. Andrew's Protestant Episcopal Church, Eighth Street above Spruce, and was one of the vestrymen at the time of his decease. He was also President of the Laurel Hill Cemetery Company, of which his father was one of the founders.

His funeral services were held on Friday afternoon, September 28th, at St. Andrew's Protestant Episcopal Church, and was largely attended by his many friends.

He was a member of the Alumni Association of the Philadelphia College of Pharmacy. W. E. K.